A

COURSE OF EXAMINATIONS,

&c. &c.

A

COURSE OF EXAMINATIONS

ON

ANATOMY AND PHYSIOLOGY, SURGERY, CHEMISTRY, MATERIA MEDICA, MIDWIFERY,

AND

THE PRACTICE OF MEDICINE.

ADAPTED TO THE

UNIVERSITY OF PENNSYLVANIA,

AND THE OTHER MEDICAL SCHOOLS IN THE UNITED STATES.

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TO

THOSE GENTLEMEN

THROUGHOUT THE UNITED STATES WHO ARE ENGAGED IN

THE STUDY OF MEDICINE;

PARTICULARLY TO

SUCH OF THEM AS ARE PREPARING TO UNDERGO AN EXAMINATION,

THIS HUMBLE ATTEMPT

TO

FACILITATE THEIR LABOURS, IS RESPECTFULLY DEDICATED

BY THE AUTHOR.

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APPENDIX.

A

COURSE OF EXAMINATIONS,

&c. &c.

SECTION I.

Examinations in Anatomy and Physiology.

Question. Are bones inorganic concretes?

Answer. No: they are regularly organized bodies, containing blood-vessels, absorbents, &c. This is proved by the fact, that bones are capable of the process of ulceration, granulation, &c., and by the re-union of bones after being fractured. Their vessels may be rendered evident by injection and subsequent maceration in a corroding liquor.

Q. What forms the solid basis of bones?

A. Principally the phosphate of lime.

Q. What is the theory of ossification?

A. The bones at first consist of a jelly, which is afterwards converted into cartilage; the absorbents now remove a portion of the cartilage and form cavities, into which the arteries deposit the osseous matter. Sometimes, however, the bony matter is deposited between membranes, in place of in cartilage, which is the case in the flat bones.

Q. What is the membrane called which invests the bones?

A. It is called periosteum.

Q. What do you mean by epiphyses?

A. They are those portions of the bones of the infant, which are separable from the bone to which they belong, but which, in the adult, adhere and become a part of the bone.

Q. What do you mean by the term symphysis?

A. I mean, not only the subsequent concretion of bones, originally separate, but also the connection of bones with each other by means of intermediate substances.

Q. How many species of symphyses are there?

A. *Synchondrosis*, or the connection by cartilage; *synneurosis*, or the connection by ligament, and *syssarcosis*, or the connection by flesh.

Q. Give an example of each of these species of symphysis?

A. The bodies of the vertebræ are connected together by synchondrosis; the bones forming moveable articulations, by synneurosis; and the scapula is attached to the ribs by syssarcosis.

Q. Into how many parts is the scull divided?

A. Into the bones of the cranium, and those of the face.

Q. What bones compose the cranium?

A. The os frontis, ossa parietalia, ossa temporum, os occipitis, os ethmoides, and os sphenoides.

Q. What do you mean by apophyses?

A. They are the *processes*, or projecting parts of bones.

Q. How are the bones of the cranium united?

A. They are united by suture.

Q. How many bones compose the face?

A. Thirteen; viz. The two ossa maxilaria superiora, the two ossa malarum, the two ossa nasi, the two ossa lacrymalia, the two ossa palati, the two ossa turbinata inferiora, and the vomer.

Q. How many tables have the bones of the cranium?

A. Two; an internal and an external.

Q. What suture connects the frontal with the parietal bones?

A. The coronal.

Q. Describe the frontal bone.

A. The frontal bone has some resemblance to the shell of the clam; it is placed at the anterior part of the scull, and forms the forehead and upper parts of the orbits. It receives the anterior lobes of the cerebrum; has a notch, between its orbital processes, for the eth-

moid bone; is internally concave and externally convex, having several elevations and depressions.

Q. What name has been given to the internal table of the bones of the scull?

A. It has been called vitreous, from its supposed glassy appearance.

Q. What is the periosteum of the bones of the cranium called?

A. Pericranium.

Q. What is the substance uniting the two tables of the bones of the cranium called?

A. Diploë. It is of a cellular structure.

Q. What do you mean by pericondrium?

A. It is the thin membrane by which cartilages are enveloped, serving to them the same purposes, as the periosteum does to the bones.

Q. By what suture is the occipital bone united to the parietal?

A. By the lambdoidal.

Q. How many bones compose the orbit?

A. A portion of seven; viz. of the frontal, ethmoidal, sphenoidal, palatine, unguis, superior maxillary, and the malar.

Q. Describe the situation of the sphenoidal bone.

A. The sphenoidal bone is situated in the middle of the basis of the cranium, extending underneath, from one temple to the other.

Q. To what bones is the frontal connected?

A. Superiorly to the parietal, posteriorly and inferiorly to the sphenoid, and inferiorly to the bones of the face.

Q. By what suture are the parietal bones connected?

A. By the sagittal.

Q. Describe the parietal bones.

A. They are nearly of a quadrangular shape, convex externally, and concave internally. They are situated at the superior and lateral parts of the scull, forming a covering to the middle lobes of the brain.

Q. To what bone does the crista galli appertain?

A. To the ethmoid; it forms a projecting process within the cranium, to which the beginning of the falciform ligament of the dura mater is attached.

Q. To what bone does the sella turcica belong?

A. To the sphenoid; it is placed in the middle, and projects into the cavity of the cranium.

Q. What suture connects the temporal bones to the parietal?

A. The squamous.

Q. What composes the septum narium, in the recent subject?

A. The nasal lamella of the ethmoid bone, the vomer, and, anteriorly, a portion of cartilage.

Q. What is situated in the sella turcica?

A. The pituitary gland.

Q. Describe the temporal bones.

A. Each temporal bone is divided into three parts; a squamous or upper portion, which is of a semicircular form, and smooth externally; a mastoid portion, situated posteriorly, and a petrous portion, which is nearly triangular, projecting internally and forwards. They are situated at the lower part of the side and basis of the cranium.

Q. How many parts open into the nose?

A. The frontal, ethmoidal, and sphenoidal cells: the maxillary sinus, and the lacrymal duct.

Q. What is the situation of the great occipital foramen?

A. In the occipital bone, at the inferior part, between the condyles, and behind the cuneiform process.

Q. To what bones are each of the parietal connected?

A. To its fellow laterally, anteriorly to the os frontis, inferiorly to the os temporis, posteriorly to the os occipitis, and by its anterior inferior angle to the os sphenoides.

Q. Where is the os ethmoides situated?

A. At the root of the nose, between the two orbitar processes of the os frontis.

Q. What is the form and structure of the ethmoid bone?

A. It is nearly a cube in form, and perfectly cellular.

Q. In what bone do we find the antrum maxillare, or highmorianum?

A. In the superior maxillary.

Q. What occasions the difference between the size of

the opening of this sinus into the nose, in the skeleton and in the recent subject?

A. In the recent subject it is partly closed by a portion of the palate-bone, by a portion of the os unguis, and by the inferior turbinated bone.

Q. In what bone is the organ of hearing situated?

A. In the petrous portion of the temporal.

Q. What bone separates the ethmoid from the occipital?

A. The sphenoid.

Q. To what bones are the temporal connected?

A. Anteriorly, to the sphenoid bone; superiorly, to the parietal; posteriorly, to the occipital; and to the lower jaw, by ginglymus articulation.

Q. To what bone do the superior turbinated bones belong?

A. They are a part of the ethmoid.

Q. How many teeth are there in the adult?

A. Thirty-two; sixteen in each jaw.

Q. How many bones are contained within the cavity of the tympanum?

A. Four; viz. The malleus, incus, os orbiculare, and the stapes; they are articulated one to the other, and form a kind of chain from the membrana tympani, to which the malleus is attached, to the labyrinth.

Q. Of what substances are the teeth composed?

A. They consist of two substances, being internally bony, and covered externally by enamel, which is very hard, and apparently unorganised.

Q. What separates the antrum highmorianum from the orbit?

A. The orbitar plate, or process, of the superior maxillary bone.

Q. To what bones is the ethmoid connected?

A. To the frontal, nasal, superior maxillary, palatine, sphenoidal, and the vomer.

Q. Into how many portions is each tooth divided?

A. Into its corona, or that portion which is exterior to the socket; its neck, or the narrow part which is encompassed by the gum; and its roots, which are either one, two, or three processes proceeding from the neck, and contained within the socket.

Q. Where are the ossa nasi situated?

A. They form the arch of the nose.

Q. Describe the occipital bone.

A. It is irregularly rhomboidal, its inferior angle projecting forward, which part is called the cuneiform process; while its superior one is rounded, and its lateral angles are obtuse. It is concave internally, and convex externally. It is situated at the posterior and inferior part of the cranium, supporting the cerebellum and medulla oblongata, giving exit through its foramen magnum to the spinal marrow, and connecting, by means of its condyles, the head with the trunk.

Q. What are the peculiarities in which the bones of the fœtal differ from those of the adult cranium?

A. The bones composing the vault of the cranium, in the fœtus, consist of but *one table*, composed of radiated fibres. The *os frontis* consists of two lateral portions. The *parietal bones* are incomplete at their angles and edges, being irregularly oval. The *temporal bones* have no mastoid or styloid processes; in place of the meatus auditorius externus there is a bony ring, into which the membrana tympani is inserted; this ring, the squamous and the petrous portions are originally separate, but frequently adhere at birth. The *os occipitis* is composed of four portions; the lambdoidal portion, each side of the foramen magnum with its condyle, and the cuneiform process, being separate from each other. The *sphenoidal bone* is separable into three portions: 1st. the body with the lesser wings; 2d. the greater wings with the pterygoid processes; and 3d. the body. The *ethmoid bone* is cartilaginous, and divided into two portions by a partition of cartilage occupying the place of the crista galli and nasal plate. There are, besides these peculiarities of the fœtal head, two deficiencies in the bones called fontanelles, the one anterior, between the angles of the frontal and parietal bones, the other posterior, between the angles of the parietal and occipital bones.

Q. Into how many classes are the teeth arranged?

A. Into the incisores, cuspidati, bicuspides, and molares.

Q. What are the situation and number of each of these classes?

A. The incisores are the four broad teeth, situated in the front of each jaw; the cuspidati, or canine teeth, are two in number, and are situated one on each side of the incisors; next to the cuspidati are placed the bicuspides, there being two on each side; and finally, on either side of the bicuspides are situated three molares, or grinders, in each jaw.

Q. Where is the vomer situated?

A. In the centre of the nostrils; having the sphenoid and ethmoid bones at its upper part, and the superior maxillary and palate bones at its lower part, and the cartilaginous septum of the nose anteriorly.

Q. To what bones is the os sphenoides connected?

A. To the frontal, ethmoidal, malar, palatine, maxillary, occipital, parietal, and to the vomer.

Q. Where are the ossa unguis situated?

A. At the anterior edge of the inner angle of each orbit.

Q. How many teeth compose the first or infantile set?

A. Twenty; viz. eight incisors, four canine, and eight molar.

Q. Where are the ossa malarum situated?

A. They form the prominence of the cheeks.

Q. To what bones is the occipital connected?

A. Anteriorly to the sphenoid; superiorly, to the parietal; laterally, to the temporal; and inferiorly, to the atlas, by ginglymus articulation.

Q. At what time of life do the teeth begin to appear through the gums?

A. They begin to appear generally about the sixth month, and are completed by the second year.

Q. What is the situation of the ossa palati?

A. They are placed at the posterior part of the orbit, nares, and palate.

Q. At what age do the first set of teeth begin to be shed?

A. They begin to be shed at about seven years of age, and the process is generally finished, and the permanent set completed, by the fourteenth year, excepting

the two last molares, which do not appear until about the twenty-first year.

Q. How is the shedding of the teeth effected?

A. By the absorption of the fangs of the first set, and also of their sockets.

Q. In what circumstances do the bones of the face in the fœtus differ from those of the adult?

A. The *superior maxillary bones* are without sinuses, and the orbitar plates are but little elevated above the cavities for the posterior teeth: the *inferior maxillary bone* is formed of two pieces which unite at the middle, hence called its *symphysis*. The bone is also narrower in proportion than in the adult, the angles more obtuse, and the process more oblique.

Q. What is contained within the cranium?

A. The brain with its membranes, and the commencement of the nine first pair of nerves.

Q. Into how many parts is the brain divided?

A. Into the cerebrum, cerebellum, pons varolii, and medulla oblongata.

Q. By what openings do the first pair of nerves pass out of the cranium?

A. Through the foramina of the cribriforme plate of the os ethmoides.

Q. What bones form the foramen lacerum at the basis of the cranium?

A. The temporal and occipital.

Q. What parts does the foramen lacerum, at the basis of the cranium, transmit?

A. The jugular vein and the par vagum.

Q. By what membranes is the brain enveloped?

A. By the dura and pia maters, and the tunica arachnoides.

Q. What do you mean by the falx cerebri?

A. It is a duplicature of the dura mater, which passes down between the two hemispheres of the cerebrum, and extends from the crista galli, along the sagittal suture, and to the middle of the temporal bone.

Q. Of what substances is the mass of the brain said to consist?

A. Of two; an external, called the cortical or ceneri-

tious, which is of a reddish colour; and an internal, called the medullary, which is perfectly white.

Q. Through what foramina do the optic nerves pass out of the cranium?

A. Through the foramina optica of the sphenoid bone.

Q. What are the cavities in the brain called?

A. Ventricles.

Q. How many are there?

A. Four.

Q. What vessel is contained in the upper edge of the falx cerebri?

A. The great longitudinal sinus.

Q. What do you mean by the tentorium?

A. It is a horizontal process of the dura mater, stretched across the posterior part of the cavity of the cranium, and is attached, along the grooves of the lateral sinuses, on the occipital bone, and to the angles of the petrous portions of the temporal bones, and terminates at the posterior clinoid processes of the sphenoid bone, being situated between the cerebrum and cerebellum, supporting the posterior lobes of the former.

Q. Through what foramina do the third, fourth, and sixth pair of nerves pass out of the cranium?

A. Through the foramina lacera of the sphenoid bone.

Q. What do you mean by the corpus callosum?

A. It is an oblong white body, which forms the bottom of the fissure which divides the two hemispheres of the cerebrum; through the middle of it runs a groove, denominated its raphe, bounded on each side by a small medullary chord.

Q. Through what foramen does the internal carotid pass into the cranium?

A. Through the carotid foramen, which is situated in the petrous portion of the temporal bone.

Q. What is the situation of the lateral ventricles?

A. They are situated in the centre of the brain, immediately under the corpus callosum.

Q. What separates them from each other?

A. The septum lucidum.

Q. Through what foramina do the eighth pair of nerves pass out of the cranium?

A. Through the foramina lacera at the basis of the cranium, along with the jugular veins.

Q. What do you mean by the corpora striata?

A. They are two pyriform eminences, situated at the bottom of the anterior and outer part of the lateral ventricles, with their larger extremities forwards; they are composed of alternate striæ of medullary and cortical matter.

Q. What is the situation of the third ventricle of the brain?

A. It is situated between the two thalami nervorum opticorum.

Q. What is the appearance and situation of the pineal gland?

A. It is an irregularly round, and sometimes conical body, situated behind the thalami nervorum opticorum, to which it is connected by two medullary chords, called its peduncles. and resting upon the tubercula quadrigemina; it consists mostly of cortical substance, and frequently contains a sandy matter.

Q. Through what foramina do the ninth pair of nerves pass out of the cranium?

A. Through the anterior condyloid foramen, in the occipital bone.

Q. What do you mean by the thalami nervorum opticorum?

A. They are two bodies, of an oval shape, and convex superiorly, situated in the brain, between the posterior extremities of the corpora striata, and covered by the fornix.

Q. What is the situation of the fourth ventricle?

A. It is situated behind the tubercula quadrigemina, between the cerebellum, the under part of the pons varolii, and the upper part of the medulla oblongata.

Q. What do you mean by the fornix?

A. It is a medullary body, situated immediately under the septum lucidum, and over the thalami nervorum opticorum; of a triangular form, with its basis presenting posteriorly.

Q. What is the medulla oblongata?

A. It is a large medullary body, situated in the middle of the basis of the brain; it is formed by the union

of the crura of the cerebrum and cerebellum, and terminates posteriorly in the medulla spinalis.

Q. What is the situation of the pons varolii?

A. It is situated at the basis of the cranium, over the place where the crura of the cerebrum and cerebellum unite to form the medulla oblongata.

Q. What separates the cavity of the third, from the cavity of the fourth, ventricle?

A. A thin medullary lamina, called the valve of Vieussens, or the valve of the brain.

Q. Describe the spine.

A. The spine is a long, bony, and cartilaginous, hollow column, consisting of twenty-four bones, or vertebræ, and extending from the occipital bone to the os sacrum.

Q. Into how many classes are the vertebræ divided?

A. Into three; viz. the seven first are denominated cervical; the twelve next, dorsal; and the five inferior ones, lumbar.

Q. Of how many parts is each vertebra composed?

A. Of its body, a bony ring, and of seven processes; viz. two transverse, four oblique, or articulating, and one spinous, projecting backwards.

Q. What are the distinguishing marks of a cervical vertebra?

A. The body is flattened anteriorly, and is thinner than the other vertebræ; its upper side is concave from side to side, and its lower, hollowed from before backward; the spinous processes are more straight, and bifurcated at the extremity; the transverse processes are very short, slightly bifurcated, and perforated perpendicularly at their bases; they are also grooved in the upper side. The oblique processes are more oblique, their articulating surfaces in the upper ones being turned backwards and upwards, and in the inferior forward and downwards.

Q. What are the peculiarities of the first vertebra?

A. It has no body nor spinous process. Its transverse processes are longer than those of the rest, and terminate in an obtuse point. The superior articular processes are larger than the rest, and form oblong horizontal

cavities for the reception and articulation of the condyles of the os occipitis.

Q. What are the distinguishing marks of a lumbar vertebra?

A. The body is much larger than that of any of the other vertebræ; its spinous processes are short, straight, and broad on each side, but narrow above and below. The transverse processes are longer and more slender than in the other vertebræ, and are flattened anteriorly and posteriorly; they increase in length, from the first to the third, then diminish to the fifth. The superior articular processes are concave; the inferior convex, lengthwise.

Q. What are the peculiarities of the vertebra dentata?

A. Its body is narrow and long, and it has upon its upper part a pivot or process, denominated dentatus, upon which the first vertebra turns, when the head is rotated to one side.

Q. What is contained in the cavity of the spine?

A. The medulla spinalis.

Q. In what manner are the nerves given off by the spinal marrow?

A. They are given off in fasciculi from the anterior and posterior surfaces of each lateral portion of the spinal marrow, each nerve being formed of two fasciculi, one from before and one from behind. Between these two fasciculi, passes a fine ligamentous chord, which is attached above to the dura mater at the foramen magnum, and continues to the coccygis.

Q. What parts compose the bony thorax?

A. Posteriorly, the dorsal vertebræ; laterally, the ribs; and anteriorly, the sternum.

Q. What parts complete the cavity of the thorax, in the recent subject?

A. The intercostal muscles and the diaphragm.

Q. How many ribs are there?

A. There are twelve on each side.

Q. Of how many parts is the sternum composed?

A. Of three.

Q. Into how many classes are the ribs divided?

A. Into two; the seven first on each side, which are

attached, by their cartilages, immediately to the sternum, are denominated true ribs; the five others, the cartilages of which are either attached to the cartilages of those above them, or remain unconnected, are called false ribs.

Q. What are the distinguishing marks of the dorsal vertebræ?

A. Their bodies are most convex anteriorly; their upper and lower surfaces are nearly flat, and on each side, there are two small articulating surfaces, one above, and one below, to receive the heads of the ribs. The spinous processes are long and sharp; slightly hollowed below, and sharp above, and considerably inclined downwards. The articulating processes are almost directly above and below the transverse, and are perpendicular rather than oblique. The transverse processes are pretty long superiorly, but diminish as they descend. The anterior part of their tips is covered with cartilage, and receives the tubercles of the ribs; these depressions diminish as they descend, and do not exist at all in the two last.

Q. In what does the first, and two last ribs, differ from the rest?

A. The first rib differs from the rest, in being placed horizontally; in having its head connected with only one vertebra; in having no groove in its inferior edge; and in being connected to the sternum without the intervention of a cartilage. The two last have their heads connected each to one vertebra only. They have no connection with the transverse processes; there is no groove in their inferior edge, and their cartilages are neither directly nor indirectly connected with the sternum.

Q. What is contained in the cavity of the thorax?

A. The heart and great vessels, and the pericardium; the lungs, the œsophagus, and, in the fœtus, the thymus gland.

Q. What is situated in the groove, at the lower and internal edge of each rib?

A. The intercostal artery, vein, and nerve.

Q. By what membrane is the cavity of the thorax lined?

A. By the pleura, which also covers the different viscera, and divides the thorax into two cavities.

Q. Between what muscles does the subclavian artery pass, as it goes over the first rib in its exit from the thorax?

A. Between the anterior and middle scalenus muscles.

Q. Describe the heart.

A. It is a hollow muscular organ, which receives the blood from, and transmits it to, all the different parts of the body. It is somewhat of a conical form, but is flattened on its inferior side; it is invested by the pericardium, and rests upon the diaphragm, in the middle cavity of the mediastinum.

Q. What are the arteries given off by the thoracic aorta?

A. The bronchial, the œsophageal, and the inferior intercostal arteries.

Q. What do you mean by the mediastinum?

A. It is a duplicature of the pleura, which passes from the spine to the sternum, dividing the thorax into two cavities.

Q. Of how many lobes do the lungs consist?

A. The right lung is divided into three lobes, the left into two.

Q. How many openings has the right auricle of the heart?

A. Three; viz. the openings of the two cavæ, and of the coronary vein.

Q. By what arteries is the heart nourished?

A. By the coronary.

Q. What are those glands called, which are situated at the root of the lungs?

A. The bronchial glands; they are of a dark colour.

Q. What prevents the regurgitation of the blood from the right ventricle into the right auricle, when the former contracts?

A. The tricuspid valve.

Q. What is the use of the lungs?

A. The blood, in passing through them, is converted, from a dark purplish colour, into a bright scarlet, and has also its temperature increased.

Q. What do you mean by the cordæ tendineæ?

A. I mean those tendinous chords which connect the columnæ carneæ to the valves of the heart.

Q. What divides the two lungs from each other?

A. The mediastinum.

Q. What are the valves at the origin of the aorta called?

A. They are called the semilunar, and are three in number.

Q. How many openings has the left auricle of the heart?

A. Four; which are the openings of the four pulmonary veins.

Q. What prevents the blood from passing back into the left auricle, on the contraction of the left ventricle?

A. The mitral valve.

Q. Which are the nutrient vessels of the lungs?

A. The bronchial; which arise immediately from the aorta.

Q. Where does the heart receive its nerves from?

A. Principally from the cardiac plexus.

Q. Where do we find the valve of Eustachius?

A. It is a fold of the inner membrane of the right auricle, and is situated to the left of the opening of the inferior cavæ.

Q. Where do the lungs receive their nerves from?

A. From the eighth pair, and the great sympathetic.

Q. What do you mean by the musculi pectinati?

A. I mean a number of muscular eminences, found principally on the parietes of the right auricle, and supposed to have some resemblance to the teeth of a comb.

Q. How many cavities are formed within the duplicature of the mediastinum?

A. Three; an anterior, containing the thymus gland, in the fœtus; the middle, containing the heart and pericardium; and the posterior, containing the bronchia, œsophagus, descending aorta, the descending cava, the vena azygos, the thoracic duct, the par vagum, and great sympathetic nerve.

Q. What is meant by the columnæ carneæ?

A. They are fleshy pillars, which arise from the sides

of the ventricles, and are attached, by means of the cordæ tendineæ, to the valves.

Q. What is the mechanism of respiration?

A. The intercostal muscles contract, and raise the ribs. The ribs being placed sloping obliquely downwards, of course, when they are raised, carry off the sternum to a greater distance from the spine, and thus enlarge the anterio-posterior dimensions of the cavity of the thorax; its lateral dimensions are increased by the ribs rocking out at their angles, and the diaphragm likewise descends, and increases its depth. A vacuum now exists between the lungs and the pleura costalis, which permits the air to rush in at the larynx, and distend the cells of the lungs. Inspiration being finished, the cartilages, which, in the raising of the ribs, were somewhat twisted, now regain their natural situation, and in so doing throw down the ribs; the diaphragm also ascends, and expiration is thus effected.

Q. How many kinds of articulations of bones are there?

A. Two: *synarthrosis*, or immoveable, and *diarthrosis*, or moveable articulations.

Q. How are the immoveable articulations divided?

A. Into *suture*, where the indented edges of two bones are received into each other, as in the bones of the cranium: *gomphosis*, when a bone is fixed into another like a nail in a board, as the teeth in their sockets: *schindylesis*, when the thin edge of one bone is received into a narrow furrow of another, as the nasal plate of the ethmoid bone and the vomer.

Q. How many species of diarthrosis, or moveable articulation, are there?

A. Three: *enarthrosis*, when a large head is received into a deep cavity, as the head of the femoris into the acetabulum; *arthrodia*, when a head is connected with a superficial cavity, as the humerus into the glenoid cavity of the scapula; and *ginglymus*, when the articulating surfaces of bones are so connected as to form a hinge.

Q. Of how many bones is the shoulder composed?

A. Of two; the scapula and clavicle.

Q. To what bone is the os humerus articulated?

A. It is articulated with the scapula, at its glenoid cavity.

Q. Describe the scapula.

A. The scapula is a triangular bone, situated at the upper and posterior part of the thorax. It has three margins, a spine, an acromion, and coracoid process, and an articular cavity for the head of the humerus.

Q. How many bones compose the fore arm?

A. Two; the ulna and radius.

Q. By what bone are we supported when we rest on our elbow?

A. On the ulna.

Q. What process of the ulna forms the point of the elbow?

A. The olecranon.

Q. What is the situation of the clavicle?

A. It is placed transversely, and somewhat obliquely, at the upper and anterior part of the thorax, between the scapula and sternum; it has in form a considerable resemblance to the italic *f*.

Q. Where is the ulna situated?

A. When the hand is supine, it is situated at the under and inner part of the fore arm, between the humerus and carpus.

Q. By what bone is the arm united to the thorax?

A. By the scapula.

Q. Into how many parts is the hand divided?

A. Into the carpus, metacarpus, and fingers.

Q. What bone is attached to the acromion scapula?

A. The clavicle.

Q. Of how many bones does the metacarpus consist, and what is its situation?

A. It consists of four bones, one supporting each finger; it is situated immediately below the carpus, and forms the bony structure of the palm of the hand.

Q. To which of the bones of the fore arm is the hand attached?

A. To the radius, which moves with it in the acts of pronation and supination.

Q. How many bones enter into the formation of the carpus or wrist?

A. Eight; the os scaphoides, os lunare, os cuneiforme, os orbiculare, os trapezium, os magnum, and os unciforme.

Q. What are the muscles that arise from the trunk, and are inserted into the scapula?

A. They are the trapezius, levator scapulæ, pectoralis minor, rhomboideus, serratus magnus, and subclavius.

Q. What are the veins at the flexure of the arm?

A. The cephalic, on the radial side; the basilic, on the ulnar side; and between these the median cephalic and median basilic.

Q. What muscles generally arise from the external condyle of tbe humerus?

A. The extensors and supinators of tlie hand.

Q. What artery forms the superficial palmar arch?

A. Chiefly the ulnar artery.

Q. What muscles arise from about the shoulder joint, and are inserted in the humerus?

A. The deltoides, coraco-brachialis, supra-spinatus, infra-spinatus, teres minor, teres major, and subscapularis.

Q. What muscles principally arise from the inner condyle of the os humeri?

A. The flexors and pronators of the hand.

Q. What tendon passes through the shoulder joint?

A. The long tendon of the biceps flexor cubiti.

Q. Between what tendons does the radial artery lie at the wrist?

A. Between the tendons of the flexor carpi radialis and supinator longus.

Q. What muscles are attached to the coracoid process of the scapula?

A. The coraco-brachialis, tlie pectoralis minor, and the short head of the biceps flexor cubiti.

Q. Are the nerves of the arm derived from the brain or from the spinal marrow?

A. From the spinal marrow.

Q. What forms the profundal palmar arch?

A. Principally the radial artery.

Q. How many muscles arise from the shoulder, and are inserted into the fore arm?

A. They are two in number; viz. the biceps flexor cubiti, and the long head of the triceps.

Q. On which side of the tendon of the biceps flexor cubiti is the brachial artery situated, at the bend of the arm?

A. On the inner side.

Q. What are the ligaments situated about the shoulder joint?

A. First, the capsular ligament of the joint; second, the triangular ligament, which extends from the coracoid to the acromion process; and third, the coracoid and trapezius ligaments, which extend from the clavicle to the coracoid process of the scapula.

Q. What are the muscles which arise from the arm, and are inserted into the fore arm?

A. The anconeus, the short heads of the triceps extensor cubiti, the brachialis internus, the supinator radii longus, supinator radii brevis, and the pronator radii teres.

Q. Where is the larynx situated?

A. It is situated at the upper and fore part of the neck, at the root of the tongue, constituting the upper part and entrance into the trachea.

Q. What do you mean by the pharynx?

A. It is a membranous and muscular bag, expanded above, contracted below, and terminating in the œsophagus; it is situated at the posterior part of the mouth and nares, between the larynx and cervical vertebræ.

Q. Of how many cartilages does the larynx consist?

A. Of five; viz. the thyroid, cricoid, the two arytenoid, and the epiglottis.

Q. What do you mean by the glottis?

A. It is the opening into the larynx, formed between two small ligaments, which proceed from the middle of the posterior side of the thyroid to the bases of the arytenoid cartilages.

Q. Where is the os hyoides situated?

A. It is situated at the root of the tongue, between it and the larynx. In its form it somewhat resembles the Greek letter υ.

Q. What is the situation of the common carotid artery in the neck?

A. It lies on the side of the trachea, between it and the internal jugular vein.

Q. Where is the thyroid gland situated?

A. Upon the front of the trachea, lying on the cricoid cartilage, and the cornua of the thyroid cartilage.

Q. Of what is the tongue composed?

A. Of soft muscular fibres, intermixed with a medullary or fatty substance.

Q. What is the situation of the par vagum in the neck?

A. It is situated between the carotid artery and the internal jugular vein.

Q. By what glands is the saliva secreted?

A. By the parotid, the sub-maxillary, and the sub-lingual glands.

Q. From how many sources does the tongue receive its nerves?

A. From three principal sources on each side; viz. from the fifth, the eighth, and the ninth pair of nerves of the head.

Q. Where are the ventricles of Morgagni situated?

A. They are situated immediately within the glottis, and are formed by the lining membrane of the larynx dipping down between the upper and lower ligaments of the glottis on each side.

Q. What is the situation of the sub-maxillary glands?

A. They are situated on the inside of each angle of the lower jaw, near the internal pterygoid muscles.

Q. What are the muscles which form the tongue?

A. The upper and lateral parts of the tongue are composed of the stylo-glossi muscles; its middle portion is formed of the linguales, the lower part is principally formed of the genio-glossi, and the posterior part of the stylo-glossi muscles.

Q. How many arteries has the thyroid gland?

A. Four; viz. the two superior, and the two inferior thyroidal.

Q. What is the excretory duct of the sub-maxillary gland called, and where does it open?

A. It is called the duct of Wharton; it passes between the genio-glossus and mylo-hyoideus muscles, and opens on the side of the frænum linguæ.

Q. What is the situation of the parotid glands?

A. They are situated, one on each side, between the external ear and the ramus and angle of the lower jaw, extending over some part of the masseter muscle.

Q. Where are the arteries of the thyroid gland derived from?

A. The superior ones are given off by the right and left external carotid; the inferior, by the right and left subclavian.

Q. What is the situation of the sublingual gland?

A. It is situated between the genio glossus and mylohyoideus muscles, under the anterior part of the tongue; its ducts, which are several, open under the tongue.

Q. Where does the excretory duct of the parotid gland open?

A. It passes obliquely over the masseter muscle, and perforates the cheek, opening into the mouth opposite the space between the second and third molar teeth. It is called the duct of Steno.

Q. Of what bones does the pelvis consist?

A. It is formed posteriorly by the sacrum and os coccygis, and anteriorly and laterally by the ossa innominata.

Q. How would you distinguish a male from a female pelvis?

A. In the female pelvis, the sacrum is shorter and broader than that of the male, the ilia are more expanded, and the tuberosities of the ischia are farther apart. The brim of the female pelvis is nearly of an oval shape, being wider from side to side than from the pubis to the sacrum; whereas in man it is rounder, and every where of less diameter; the sacrum is narrower, and the os coccygis more firmly connected.

Q. Describe the sacrum.

A. It is of a pyramidal form, with the basis upwards and the apex downwards; having an anterior or concave side, and a posterior or convex one, with two edges. It consists, in the fœtus, of five portions; the points of separation between which are marked by prominent lines in the adult. There are four pair of holes in the sacrum, anteriorly and posteriorly.

Q. Into how many portions is each os innominatum divided?

A. Into three; viz. the superior broad expanded part is called the os ilium; the inferior part, the os ischium; and the anterior narrow part, the pubis.

Q. What are the ligaments of the pelvis?

A. 1st. Poupart's ligament, which arises from the superior anterior spinous process of the ilium, and is inserted into the angle of the pubis; 2d, the annular ligament, which surrounds the articulation of the ossa pubis; 3d, the obturator ligament, closing up the foramen thyroideum, excepting at the upper part, where a notch is left; 4th, the transverse ligaments, arising from the transverse processes of the three last lumbar vertebræ, and inserted into the back part of the ilium; 5th, the ilio-sacral ligament, arising from the posterior part of the ilium, and inserted into the back of the sacrum; 6th, the sacro-ischiatic ligament, arising from the ischium, and inserted into the sacrum; 7th, the ligamenta vaga, which pass from the ilium to the sacrum.

Q. Where is the tuberosity of the ischium situated?

A. At the most inferior part of the os innominatum; it is the part we rest upon when sitting.

Q. What is meant by the brim of the pelvis?

A. It is a ridge which extends, inside of the pelvis, from the symphysis pubis to the junction of the os innominatum with the sacrum, on a level with the upper margin of the pubis, and forms the line of division between the pelvis and abdomen.

Q. What are the connexions of the os sacrum?

A. It is connected laterally to the ossa innominata; superiorly, to the last lumbar vertebra; and inferiorly, to the coccygis.

Q. What is the situation of the coccygis?

A. It is attached to the lower part of the sacrum.

Q. Describe the urinary bladder.

A. It is a large membranous bag, somewhat of an oval form, which serves as a reservoir for the urine; it is situated in the front of the pelvis, immediately behind the symphysis pubis, and before the rectum.

Q. Of what parts do the male organs of generation consist?

A. Of the testicles, with the epididymis and vasa deferentia, contained in the scrotum; of the vesiculæ seminales, prostate gland, Cowper's glands, caput galinaginis, and the penis.

Q. What forms the scrotum?

A. It is formed by a continuation of the common integuments.

Q. How many coats has each testicle?

A. Two; the tunica albuginea, which firmly invests the testicle; and the tunica vaginalis which loosely envelopes it, as the pericardium does the heart.

Q. Of how many parts does the penis consist?

A. Of the corpora cavernosa, corpus spongiosum, the urethra, and glans penis.

Q. What are the female organs of generation?

A. Internally, they are the uterus with its appendages, the ovaria, fallopian tubes, and vagina; and externally, the mons veneris, labia pudendi, nymphæ, and clitoris.

Q. Where is the prostate gland situated?

A. It lies directly under the symphysis pubis, embracing the neck of the bladder, and resting upon the rectum.

Q. Where are Cowper's glands to be found?

A. They are situated near the bulb of the urethra, before the prostate gland.

Q. Describe the uterus.

A. It is a spongy hollow viscus, of a pear shape, situated in the pelvis of the female, between the rectum and the urinary bladder; it is divided into a fundus, cervex, and orifice, or os tincæ, and has four ligaments.

Q. How many openings are there into the bladder?

A. Three; one inferior, which is the beginning of the urethra, surrounded by the neck of the bladder; and two posterior, which are the terminations of the ureters.

Q. What is the situation of the ovaries?

A. They are situated, one on each side of the uterus on the posterior surface of the broad ligament, and are invested by a process of the posterior lamina of the ligament, which forms for each a coat and ligament. Besides this peritoneal coat, each ovary has its own proper coat.

Q. Through what tube does the ovum pass into the uterus from the ovaria, after conception?

A. Through the fallopian tubes.

Q. Where are the fallopian tubes situated?

A. They proceed between the laminæ of the broad ligaments, from the orifices at the superior angles of the uterus, in a transverse direction, to some distance from the uterus, when they form an angle and dip downwards towards the ovaries.

Q. What is the excretory duct of the testicle called?

A. The vas deferens.

Q. At what part is the urethra most dilated?

A. At that part which is surrounded by the prostate gland.

Q. How many ligaments has the uterus?

A. It has two lateral or *broad* ligaments, *two anterior* and *two posterior* ligaments, and two round ligaments?

Q. What is the situation and attachments of these ligaments?

A. The broad ligaments are two duplicatures of peritoneum, which proceed one from each side of the uterus to the lateral parts of the pelvis. The anterior and posterior ligaments are four small plaits or folds of the peritoneum, two of which extend from the uterus to the bladder, and two posteriorly to the rectum. The round ligaments arise from each side of the uterus below its superior angles, and proceed, invested by peritoneum, to the abdominal rings.

Q. What do you mean by the clitoris?

A. It is a firm projecting body, about an inch in length, situated immediately under the superior commissure of the labia pudendi, consisting, like the penis, of two corpora cavernosa, forming a glans anteriorly, and dividing posteriorly into two crura; like the penis it is capable of erection.

Q. In what manner do the ureters enter the bladder?

A. They pass obliquely through its coats, and open about an inch and a half from each other, and the same distance from the orifice of the urethra.

Q. What do you mean by the spermatic chord?

A. It is a chord composed of the trunks of the different vessels belonging to the testicle; it is invested by

the same process of the peritoneum, which forms the tunica vaginalis testis, and is covered by the cremaster muscle, and extends from the abdominal ring to the body of the testis.

Q. What is the length of the female urethra?

A. It is about an inch to an inch and a half in length.

Q. By what arteries is the uterus supplied with blood?

A. By branches from the spermatic and hypogastric, but principally from the latter; these branches are called *uterine*.

Q. Where are the testicles situated in the fœtus?

A. Previously to the sixth month they are situated in the abdomen, at the lower part of the kidneys, and receive a covering from the peritonæum.

Q. Where do the corpora cavernosa penis arise?

A. They arise from the edge of the ramus of the ischium and pubis.

Q. What do you mean by the veru montanum, or caput gallinaginus?

A. I mean a small oblong oval eminence, situated immediately within the prostate gland, at the under part of the urethra.

Q. How many openings are there into the uterus?

A. Three; the orifices of the two fallopian tubes at the angles of its fundus, and the os uteri at its neck.

Q. How many dilatations are there in the male urethra.

A. Generally three; one at the point of the glans penis, another at the bulb of the urethra, and a third within the prostate gland.

Q. How many coats has the bladder?

A. It has a muscular, a nervous or cellular, and a villous or mucous coat; and its fundus, sides, and back part, to a little way within the termination of the ureters, receive a covering from the peritonæum.

Q. What do you mean by the vesiculæ seminales?

A. I mean two small oblong membranous bodies, situated obliquely at the lower and under part of the bladder and before the rectum, near each other before, but diverging posteriorly; they are formed by the convolution of one tube, whose doublings are so closely

connected together, that internally the vesiculæ seem composed of cells.

Q. Where do we find the orifice of the urethra in females?

A. It is situated between the nymphæ, about an inch below the clitoris, and just above the orifice of the vagina; the orifice is slightly prominent.

Q. How long is the female urethra?

A. It is about an inch in length; it has no prostate gland.

Q. What is meant by menstruation?

A. It is the discharge of a sanguineous fluid from the uterus, which occurs every month in the healthy female.

Q. At what period of life does menstruation exist?

A. From the fourteenth to the forty-fifth year, generally speaking.

Q. How is the cavity of the abdomen formed?

A. It is formed above, by the diaphragm and the margin of the thorax; behind, by the lumbar vertebræ; below, by the pelvis; and anteriorly and laterally, by the abdominal muscles.

Q. How many abdominal muscles are there?

A. There are five pair; viz. the obliquus externus abdominis descendens; the obliquus internus ascendens; the transversalis abdominis; the rectus abdominis; and the pyramidalis.

Q. What is the membrane called that lines the cavity and covers the viscera of the abdomen?

A. The peritonæum.

Q. How would you distinguish the small from the large intestines?

A. The large intestines have three longitudinal bands, running on their surface; they are lobulated, and have portions of fat adhering to them, called appendiculæ epiploicæ, which circumstances are absent in the small intestines. In the small intestines exist the valvulæ conniventes, but not in the large.

Q. How many openings are there in the stomach?

A. Two; the cardia, which is situated at the superior part, at a little distance from the great extremity, and receives the œsophagus; and the pylorus, which is situa-

ted at the termination of the lesser extremity, and opens into the intestines.

Q. Describe the liver.

A. The liver is the largest of the abdominal viscera; it is placed in the right hypochondriac region, and extends partly into the epigastric region. It is divided into three lobes, is suspended by five ligaments, which are productions of the peritonæum, and is composed of arteries, veins, nervcs, absorbents, excretory ducts, cellular membrane, &c. and is invested by the peritonæum.

Q. What is situated between the two laminæ of the mesentery?

A. The lacteals, arteries, lymphatics, veins, nerves, and glands of the intestines.

Q. Describe the stomach.

A. The stomach is a membranous bag, somewhat resembling in form the bagpipe, placed in the left hypochondriac and epigastric regions. It is composed of three coats, and has a superior orifice, called cardia, and an inferior, called pylorus; a greater and lesser curvature, and two surfaces, an anterior and posterior.

Q. What is the situation of the gall-bladder?

A. It is situated in the anterior part of the inferior surface of the great lobe of the liver.

Q. What is the course of the bile through and from the liver?

A. The bile, secreted by the extremities of the vena portæ, in the acini of the liver, passes through the pori baliarii and branches of the hepatic duct; by this duct it is conveyed to the ductus communis coledochus; from whence it passes, through the cystic duct, into the gall-bladder; when it passes into the intestines, it returns, through the cystic duct, and, mixing in the ductus communis with fresh bile from the hepatic duct, is conveyed into the duodenum.

Q. What is the first artery given off by the aorta after passing into the abdomen?

A. The cæliac.

Q. What viscera are attached to the great curvature of the stomach?

A. The great omentum, the spleen, and the transverse arch of the colon.

Q. What are the blood-vessels of the liver?

A. They are, 1st, the hepatic artery, or nutrient vessel of the liver; 2d, the vena portæ, from the blood of which the bile is secreted; and 3d, the hepatic veins, by which the blood of the hepatic artery and of the vena portæ is returned into the cava.

Q. What is the situation and nature of the pancreas?

A. It is situated at the back part of the epigastric region, transversely under the stomach and before the spine, the crura of the diaphragm, and the aorta or vena cava. It is a glandular body, of an oblong flat form, and of a greyish white colour; it secretes a fluid resembling the saliva.

Q. How many vessels go to the stomach, and from whence do they arise?

A. There are three principal branches; viz. the superior coronary, which arises from the cæliac; the right gastro epiploic, which is a branch of the hepatic, and the left gastro epiploic, which is a branch of the splenic. Besides this, several small branches pass from the splenic to the greater extremity of the stomach, and are called vasa brevia.

Q. Describe the situation and course of the colon.

A. The colon commences at the cœcum, in the right iliac region, ascends in the right lumbar region, over the kidney of that side, to the liver; it now crosses the abdomen, under the liver and stomach, forming its great arch, and passes to the left side, where it descends, by a sigmoid flexure, to the pelvis, and terminates in front of the spine, in the rectum.

Q. What difference is there between the situation of the right and left kidneys?

A. The right kidney is much lower than the left, occasioned by the liver occupying so much space.

Q. What are the vessels surrounded by the capsule of Glysson?

A. They are the vena portæ, the hepatic artery and veins, the excretory ducts of the liver, and some absorbents.

Q. What do you mean by the spleen?

A. It is a soft sponge-like, fleshy mass, of a purple colour, and varying in size in different individuals; it is

situated deep in the left hypochondrium, at the large extremity of the stomach ; its use is unknown.

Q. Has the kidney a peritoneal coat ?

A. No ; it has no peritoneal coat, but is every where surrounded by a coat of its own, which consists of two laminæ.

Q. What is the name of the ganglion in the abdomen, from which the nerves of most of the abdominal viscera are derived ?

A. It is the semilunar ganglion, and is formed by the greater splanchnic branch of the sympathetic.

Q. What forms the capsule of Glysson ?

A. It is a reflection of the peritonæum, investing the vessels, &c. of the liver, just before they enter that viscus.

Q. How many coats have the stomach and the intestines ?

A. Four ; viz. an external or peritoneal, next a muscular, then a cellular or nervous, and internally a villous or mucous coat.

Q. What is the excretory duct of the kidney called ?

A. The ureter.

Q. What is the situation of the mesentery ?

A. It commences at the last incurvation of the duodenum, and passes obliquely from left to right along the vertebræ of the loins. To its exterior edge are attached the small intestines.

Q. Where does the excretory duct of the pancreas terminate ?

A. In the duodenum, in common with the ductus communis coledochus of the liver.

Q. What is the omentum ?

A. It is a large duplicature of the peritonæum, which is attached to the greater curvature of the stomach, and descends loosely in front of the intestines, to below the umbilicus ; it is then reflected backwards to the great arch of the colon, which is inclosed between its laminæ, after which it proceeds under the name of *mesocolon*, from the posterior surface of the colon to the back of the abdomen.

Q. What is the office of the stomach ?

A. It is to contain the food until dissolved by the gas-

tric juice, which is a peculiar fluid secreted by the arteries on its internal surface.

Q. What are the ducts that enter the duodenum?

A. The ductus communis coledochus, and the ductus pancreaticus; they in general enter by one orifice.

Q. What do you mean by the renal glands, or capsula renales?

A. They are two small oblong and flat bodies, of a dark yellow colour, situated immediately above the kidneys, on which they rest.

Q. In what intestines are the valvulæ conniventes found?

A. In the small intestines, but chiefly in the duodenum and jejunum.

Q. What forms the linea alba?

A. The junction of the flat tendons of the abdominal muscles, without the intervention of any muscular fibres.

Q. What are the arteries, which supply the kidneys, called?

A. The emulgents, or renal arteries.

Q. Where is the diaphragm situated?

A. Between the thorax and abdomen, forming a vaulted arch or septum, attached to the borders of the lowermost ribs.

Q. How is the sheath formed, in which the rectus abdominis muscle is contained?

A. The tendon of the internal oblique divides into two layers, the anterior of which joins the tendon of the external oblique, and passes in front of the rectus, and is inserted in the linea alba; the posterior layer joins the tendon of the transversalis, and passes behind the rectus, from the insertion of that muscle until about half way between the umbilicus and pubis; below this, only a few fibres of the posterior layer passes behind the rectus, the principal part being found in front of the muscle.

Q. What are the excretory ducts of the liver called?

A. Pori biliarii.

Q. On which side of the aorta is the emulgent artery the longest?

A. On the right; this arises from the vena cava being

placed upon that side, and the artery having to pass behind that vessel.

Q. What parts does the cæliac artery supply?

A. The stomach, the liver, and the spleen.

Q. From whence does the stomach derive its nerves?

A. From the eighth pair, and the great sympathetic.

Q. What do you mean by the foramen of Winslow?

A. It is a semilunar opening, situated in the omentum, on the right side, below Glysson's capsule; by which the cavity of the omentum communicates with the cavity of the abdomen.

Q. What separates the canal of the small, from that of the large intestines?

A. A valvular structure, denominated the valve of the colon, or the valve of Tulpius.

Q. Where do the lacteals terminate?

A. Into the receptaculum chyli.

Q. Where is the receptaculum chyli situated?

A. It is situated on the body of the first lumbar vertebra, behind the right crus of the diaphragm, and above the right emulgent artery.

Q. In what manner does an enlargement of the mesenteric glands cause atrophy?

A. By obliterating the cavity of the lacteals which pass through them, and thus obstructing the passage of the chyle to the thoracic duct.

Q. What vessels form the vena portæ?

A. The superior and inferior mesenteric, and the splenic.

Q. What is the course of the thoracic duct?

A. After passing between the crura of the diaphragm, it ascends on the right side of the aorta, between that vessel and the vena azygos, to the fifth dorsal vertebra, when it passes behind the œsophagus and the curve of the aorta, and ascends, on the left side of the œsophagus, to the first or second dorsal vertebra, where, leaving the carotid, it makes a semicircular turn, and terminates in the left subclavian vein.

Q. To what bone is the os femoris articulated?

A. It is articulated to the acetabulum, or cup-like cavity of the os innominatum.

Q. Upon what bone does the leg rest?

A. Upon the astragalus, to which the tibia is articulated.

Q. Where is the trochanter major situated?

A. It forms the great projection at the superior and anterior part of the thigh bone.

Q. Of how many bones does the leg consist?

A. Of two; the tibia and fibula.

Q. What bones form the hip joint?

A. The roundhead of the os femoris, and the acetabulum of the os innominatum.

Q. What forms the crural nerve?

A. The union of the three or four superior lumbar nerves.

Q. How many muscles arise from the os ilium, and are inserted into the os femoris?

A. Five; viz. the three glutæi, the iliacus internus, and the tensor vagina femoris.

Q. What do you mean by bursæ mucosæ?

A. They are mucous bags, whose internal surfaces are lubricated by a synovial fluid, interposed between tendons which rub against each other, or where they play on the surface of bones or joints, and also between the integuments and certain prominent points of bones, viz. at the knee, elbow, and knuckles.

Q. On what bone is the linea aspera situated?

A. On the back part of the os femoris.

Q. What is the situation and form of the tibia?

A. It is situated on the inner side of the leg; it is irregularly triangular, and is larger above than below.

Q. What forms the outer ancle?

A. The lower end of the fibula.

Q. In standing, what prevents the leg from falling forward?

A. The soleus or gastrocnemius internus muscle.

Q. What are the ligaments concerned in the hip joint?

A. They are, 1st, the capsular ligament, arising from the margin of the acetabulum, and inserted in the os femoris, round the root of its neck; and, 2d, the round ligament, arising from a small depression in the head of the os femoris, and inserted in the middle of the acetabulum.

Q. What muscles arise from the ischium and pubis to be inserted into the thigh?

A. From the pubis arise the pectinalis, obturator externus, and the three abductors of the thigh; from the ischium, the geminii and quadratus femoris.

Q. What bone forms the heel?

A. The os calcis.

Q. What is the situation of the popliteal artery?

A. It is situated in the ham, between the condyles of the os femoris and the heads of the external gastrocnemius muscle.

Q. What is the name of the tendon formed by the union of the tendons of the external gastrocnemius and solcus muscles?

A. The tendo achillis.

Q. What forms the inner ancle?

A. A process from the lower extremity of the tibia.

Q. What muscles are concerned in turning out the toes?

A. The obturator externus and internus, the gemini, the pyriformis, the quadratus femoris, and the glutæi.

Q. What are the ligaments which connect the os femoris with the leg?

A. They are, 1st, the capsular ligament, surrounding the joint; 2d, the popliteal, arising from the outer condyle of the femur, and expanding on the internal side of the joint; 3d, the external and internal lateral, arising from the condyles of the femur, and inserted in the upper part of the leg; and 4th, the crucial ligaments, which arise from the notch between the condyles of the femur, and are inserted in the rough ridge on the top of the tibia; these ligaments cross each other in the form of the letter X.

Q. What is the situation of the great sciatic nerve in the thigh?

A. It is situated at the back part of the thigh, descending from the pelvis, first upon the long flexors and adductor magnus, and then between the latter and the os femoris, to the ham, where it obtains the name of popliteus.

Q. Of how many bones is the metatarsus composed?

A. Of five; one supporting each toe.

Q. What are the muscles which are inserted into the os calcis?

A. They are the gastrocnemei and plantaris.

Q. What tendon does the femoral artery perforate in passing to the back of the thigh, in order to get into the ham?

A. It perforates the tendon of the adductor magnus, at the distance of about one-third of the length of the bone from its lower extremity.

Q. How many muscles are inserted in the leg?

A. Eleven; six of which, viz. the rectus, sartorius, gracilis, semitendinosus, semimembranosus, and long head of the biceps, arise from the pelvis; and five, viz. the cruralis, the two vasti, the short head of the biceps, and the popliteus, arise from the os femoris.

Q. How is the act of walking performed?

A. 1st, the weight of the body is to be removed from off the leg which is to be advanced; this is done by the action of the peronei, vastus externus, gluteus medius, &c. of the opposite side; 2d, the leg is advanced, by the action of the iliacus internus and psoæ muscles; 3d, the weight of the whole body is now to be brought over the advanced leg, and this is effected by the action of the peroneus longus, the tibialis anticus, the rectus femoris, and the psoæ and iliacus muscles of the advanced leg; when these have thrown the body as far forward as possible, the gastrocnemei and the long flexor of the big toe of the hind leg act, and, forming the foot into a lever, push the body over the advanced leg; 4th, the hind leg is advanced by the psoæ and iliacus internus of that side, and the same motions are again repeated. There is another mode of walking, which is performed merely by the twisting of the pelvis on the spine.

Q. Under what muscle is the femoral artery situated, in the middle of the thigh?

A. Under the Sartorius.

Q. How many muscles are inserted into the patella?

A. Four; viz. the rectus femoris, the two vasti, and the crureus.

Q. What is the course of the anterior tibial artery?

A. After coming off from the popliteal, it passes through a large perforation in the interosseus ligament,

to reach the fore part of the leg; the artery then passes down close to the interosseus ligament, between the tibialis anticus and extensor proprius pollicis; below the middle of the leg, it leaves the interosseus ligament, and crosses under the tendon of the extensor proprius pollicis, and passes down between that tendon and the first tendon of the extensor longus digitorum; at the ancle it passes over the front of the tibia, over the astragalus, os orbiculare, and os cuneiforme; crossing under that tendon of the extensor brevis digitorum which goes to the great toe, it arrives between the two first metatarsal bones, and then plunges down into the sole of the foot to join the plantar arch.

Q. What muscles are put in action when we rise from a seat?

A. The tibialis anticus acts powerfully to keep the tibia erect, and prevent it from inclining backwards. The two vasti, and the crureus, raise up the femoris; while the gluteus maximus, the semi-tendinosus, and semi-membranosus, and the long head of the biceps, extend the trunk of the body.

Q. What parts of the body are free from adipose structure?

A. The integuments of the penis, of the scrotum, and of the eye-lids.

Q. What is the contraction of the heart called?

A. It is called its systole.

Q. Where is the Eustachean tube situated?

A. It passes from the cavity of the tympanum obliquely forward and inward, and opens in the fauces behind the posterior nares.

Q. What are the differences between the adult and fœtal heart?

A. In the fœtal heart an opening exists between the auricles, in the septum auricularum, called the foramen ovale; this is closed in the adult heart. An artery also passes from the pulmonary artery obliquely to the ascending aorta in the fœtus, this is called the canalis arteriosus, and becomes converted into an impervious chord in the adult.

Q. Where is the external cutaneous nerve situated at the bend of the elbow?

A. It is situated under the cephalic and the median cephalic veins.

Q. How are arteries distinguished from veins?

A. By the coats of the former being whiter and more dense, and also more elastic; their apertures gape in the living body, and they pulsate. The arteries and veins of the lower extremities are very similar in regard to the thickness of their coats.

Q. What is the tunica conjunctiva?

A. It is a reflection of the inner membrane of the eyelids, over the surface of the eyes.

Q. What is meant by the diastole of the heart?

A. Its dilatation.

Q. Where are the vasa vorticosa situated?

A. On the choroid coat of the eye; they are formed by a contortion of the vessels of that membrane.

Q. What is the situation of the torcular of Herophilus?

A. It is those veins of the brain which are situated at the junction of the falx and tentorium, and receive the blood from the inferior longitudinal sinus and vena magna galeni.

Q. What parts compose the lachrymal apparatus?

A. The lachrymal gland, the caruncula lachrymalis, plica semilunaris, puncta lachrymalia, lachrymal sac, and the ductus ad nasum.

Q. What is the situation of the posterior tibial artery?

A. It is situated at the back of the leg, between the soleus muscle and the deep seated flexors of the toes.

Q. How many coats has the eye?

A. Six; viz. the tunica conjunctiva, tunica sclerotica, cornea, tunica choroides, iris, and retina.

Q. What nerves form the commencement of the great sympathetic?

A. A branch of the sixth pair, and a recurrent twig from the second branch of the fifth pair.

Q. Where is the pigmentum nigrum of the eye situated?

A. Upon the posterior part of the iris, and upon the surface of the tunica choroides.

Q. How many chambers has the eye?

A. Two; an anterior and a posterior.

Q. What separates the two chambers?

A. The iris forms a partial septum between them.

Q. What arteries are given off at the arch of the aorta?

A. Three branches; viz. the arteria innominata, the left carotid, and left subclavian.

Q. What forms the chorda tympani?

A. It is formed by a reflected twig of the portia dura, and passes between the long process of the malleus and the incus, and over the membrana tympani.

Q. How many nerves go to the eye?

A. Five pair; viz. the second, third, fourth, sixth, and first branch of the fifth.

Q. What forms the common integuments?

A. The cuticle, rete mucosum, cutis, and cellular membrane.

Q. What are the external parts of the eye?

A. They are the supercilia, or eye-brows; the eye-lids, or palpebræ, with their tarsi and cilia, or eyelashes.

Q. Where is the lachrymal sac situated?

A. At the inferior part of the inner angle of the eye, and the superior part of the lachrymal groove, in a depression of the os unguis, and behind the tendon of the orbicularis palpebræ.

Q. Of how many coats is the membrana tympanum composed?

A. Of three; viz. the lining membrane of the tympanum, the cutis, and the cuticle.

Q. What forms the phrenic nerve?

A. It is formed by the third and fourth cervical nerves, and also receives a filament from the second.

Q. What is the true organ of vision?

A. The retina.

Q. What is the general division of the internal ear?

A. It is divided into the cavity of the tympanum, and of the labyrinth, which latter consists of the cochlea, vestibulum, and semicircular canals.

Q. Which is the nerve of hearing?

A. The portio mollis of the seventh pair.

Q. How do arteries terminate?

A. They terminate either in veins, in secreting ex-

tremities, in cells, as in the penis, &c., in glands, or by anastomoses.

Q. What are the branches of the fifth pair of nerves?

A. The principal branches of the fifth pair of nerves are, 1st, the ophthalmic; 2d, the superior maxillary; and 3d, the inferior maxillary. The *ophthalmic* branch passes through the foramen lacerum of the sphenoid bone, and sends off, 1st, a frontal branch, through the superciliary notch to the forehead; 2d, a *nasal* branch, towards the inner canthus, to the lachrymal sac, which also sends branches through the internal foramina; 3d, a *lachrymal* branch to the lachrymal gland. The *superior maxillary branch* sends off, 1st, the *pterygoid* branch, one twig of which passes in at the vidian foramen to join the portio dura, and another joins a portion of the sixth pair to form the sympathetic; 2d, the *spheno palatine* to the nose, through the foramen of that name; 3d, the *palatine* down through the palatine foramen to the mouth; 4th, the *infra orbitar* through the canal of that name, to supply the upper teeth, lips, &c. The *inferior maxillary* sends off, 1st, a *temporal* branch; 2d, a branch to the cheek; 3d, a *lingual* branch, which is the true gustatory nerve; 4th, a *dental* branch, which enters the canal of the lower jaw, supplies the teeth, and finally passes out at the mental foramen to the chin.

Q. Where is the lachrymal gland situated?

A. In a depression in the orbitar plate of the os frontis, somewhat above the external angular process of that bone.

Q. Upon what vertebra is rotation of the head performed?

A. Upon the second vertebra, by the interposition of the atlas.

Q. What are the branches of the subclavian artery?

A. They are six in number; viz. the internal mammary, the inferior thyroid, the superior intercostals, the vertebral, and the cervicalis profunda and superficialis.

Q. What parts of the body do the internal and external carotids supply?

A. The *external* carotid supplies the face and external parts of the head; the *internal* supplies the brain.

SURGERY.

SECTION II.

Examinations in Surgery.

Question. What do you mean by a compound fracture?

Answer. A fracture of the bone, complicated with an external wound of the soft parts communicating with the cavity of the fracture.

Q. What is particularly to be attended to during the healing of ulcers resulting from burns?

A. To prevent, by the interposition of dressings, &c. any unnatural adhesion of contiguous parts, and, by bandages and splints, to preserve the parts in a proper position, in order to prevent any deformity from the contraction to which the cicatrices are liable.

Q. In what does a contused differ from an incised wound?

A. In an incised wound there is merely a solution of continuity in the part, whereas, in the contused wound, besides this solution of continuity, there is a bruising of the adjacent flesh.

Q. How would you treat a contused wound?

A. After removing the extraneous matter, a poultice is to be applied until the dead parts separate, and when suppuration and granulation come on, the edges of the wound are to be drawn together, and retained so by the adhesive strips; should inflammation arise to any extent, bleeding will be proper.

Q. Is the bleeding most profuse in an incised or contused wound?

A. In the incised: in the contused wound, the vessels being injured for some distance from their divided edges, their power of circulating the blood is diminished. The blood likewise being prevented from escaping readily, externally, is extravasated in the cellular membrane, making lateral pressure, and in a great measure closing the mouth of the arteries. Dr. Physick is of opinion also, that the blood more readily coagulates in the contused wound, which forms another barrier to the occurrence of hæmorrhagy to any extent in them.

Q. How is an incised wound to be treated?

A. After commanding the hæmorrhage, by pressure or by the ligature, according as a greater or less artery is wounded, all extraneous substances, the clotted blood, &c. are to be removed, and the edges are to be drawn in contact, and kept so by adhesive strips, aided by bandages, and a proper position of the part.

Q. What is the proper treatment for a burn?

A. In cases of superficial burns, the application of cold water or vinegar to the injured part is to be preferred. But when the burn is extensive, and the part has been killed by the fire, the best application appears to be the basilicon ointment, thinned with spirits of turpentine, being careful in the application to confine it solely to the burnt surface, and not to permit it to come in contact with the sound skin. If fever arises to any extent, it is to be treated on the evacuating plan. If debility comes on, cordial remedies must be administered.

Q. What are the symptoms of an inflamed ulcer?

A. A ragged elevated edge, redness and swelling of the surrounding parts, the blood quickly returning when pressed out by the finger. There is a thin serous discharge, very great sensibility of the ulcer, and occasionally excessive, though not constant, pain.

Q. What is the treatment proper for an inflamed ulcer?

A. Locally, a common poultice of bread and milk is the best application. The patient is to be confined to a horizontal position and a low diet; purging, and occasionally blood-letting, will be proper.

Q. What is the process by which nature arrests the hæmorrhage from a bleeding artery?

A. The artery, on being divided, immediately retracts within its sheath and slightly contracts, at its wounded extremity; a portion of blood is effused between the artery and its sheath, and also before the mouth of the artery, which blood forms an external coagulum; another coagulum also is formed within the artery, and extends to the next collateral branch. Inflammation of the artery takes place, and coagulable lymph is effused between the two coagula which unites them together, and adheres also all around to the inner coat of the artery, and thus seals up its divided extremity. The cavity of that portion of the vessel between the wounded extremity and the next collateral branch, becomes gradually obliterated, and the artery is converted into a ligamentous chord. When an artery is only punctured, a layer of coagulated blood is formed between the artery and its sheath, which is somewhat thicker, directly over the punctured orifice; this last is finally closed by the process of inflammation.

Q. What takes place in case an artery is wounded immediately in the vicinity of a collateral branch?

A. The external coagulum is formed as above, but there is no internal coagulum.

Q. What are the symptoms of a dislocation of the thigh upwards and backwards?

A. The limb is shortened, the toes are turned inwards and cannot be turned out, nor can the natural length be restored to the limb without reducing the dislocation.

Q. What is the difference between true and false aneurism?

A. True aneurism consists in a morbid dilatation of an artery; spurious aneurism is occasioned by the rupture or wound of an artery producing in the adjoining cellular membrane a cavity or sac containing arterial blood.

Q. Where is the operation for popliteal aneurism performed?

A. About the middle of the thigh, over the inner edge of the sartorius muscle,

Q. If in a lacerated wound a portion of the integuments, &c. were torn off to some extent, but still adhering by one extremity, would you remove this flap?

A. No; the flap should be laid loosely on the part from which it was torn, and retained in its place by a soft compress and bandage;—if the edges be drawn accurately in contact, and retained thus by adhesive plaster, when inflammation and swelling come on, the parts will be put on the stretch, the circulation through them impeded, and the whole will slough off.

Q. How are wounds of the throat to be treated?

A. Superficial wounds are to be treated in the same manner as similar species of wounds in other parts of the body; but when the trachea, &c. are cut through, after securing the blood-vessels by ligatures, we are to bring the edges of the wound as nearly in contact as possible, by bending the chin down upon the breast, and preserving it in that position by bandages, and pillows placed behind the head. All sutures, &c. are useless, or even mischievous. If the œsophagus be wounded, the patient may be nourished through a large catheter introduced into the stomach.

Q. How would you treat a punctured wound?

A. If a large artery be wounded, and continue bleeding, the wound must be dilated with a probe and scalpel, and the vessel secured by a ligature. If there be no considerable artery wounded, any extraneous substances that can be easily removed should be taken away, and a soft poultice applied. The symptoms and progress of the wound should be carefully watched, particularly in hot weather.

Q. What is to be apprehended in cases of punctured wounds?

A. Tetanus is a very frequent consequence of these wounds in warm weather.

Q. How should the wound be treated in order to prevent this occurrence?

A. By dilating it with a scalpel, and inducing inflammation in it by stimulating applications, as the oil of turpentine, a sinapism, &c. and allowing rather a generous diet.

Q. By what process is a fracture healed?

A. The vessels at the fractured extremities take on an increased action, and pour out coagulating lymph, which soon becomes vascular, and is gradually converted into bone by the deposition of osseous matter, the superfluous parts being absorbed. This uniting medicine is termed *callus*.

Q. What is an abscess?

A. It is a circumscribed cavity containing pus.

Q. What confines the pus to one particular spot, constituting an abscess?

A. Coagulable lymph is thrown out, which agglutinates together the cells of the cellular membrane, and thus prevents the pus from passing along these cells into the neighbouring parts.

Q. What is the proper treatment for a sprain?

A. As soon after the occurrence of the accident as possible cold water should be poured upon the part, and afterwards it should be wrapped in cloths wet with cold vinegar or brandy, and kept in a state of perfect rest. As the application of cold water might be productive of bad effects in females at or about the period of menstruation, the application of the brandy or vinegar should be resorted to at once. If inflammation occur, this is to be counteracted by leeches and the general depleting plan, according to the urgency of the symptoms.

Q. How does a ligature effect a permanent stoppage of the hæmorrhage from a divided artery?

A. By the ligature the inner coats of the artery are divided and kept in close contact, and are finally united by the process of inflammation, &c.; a coagulum also forms within the artery, obliterating its cavity, unless the vessel be tied near the passing off of a collateral branch, in which case no coagulum exists.

Q. How would you treat a wound occasioned by the bite of a rabid animal?

A. After carefully washing the wound with soap and water, I would completely extirpate with the knife every part with which the animal's tooth had come in contact; and, lest the scalpel should convey the poison to the newly divided parts, I would change it after each incision. The patient is also, previous to the operation,

to be stripped of all the clothing he had on at the time of receiving the bite, for fear that they might have upon them a portion of the saliva of the animal, which might again come in contact with the wound.

Q. What symptoms distinguish erysipelas from common phlegmonous inflammation?

A. In the erysipelas, the colour of the part is of a bright scarlet; in the phlegmonous, of a darker red. In phlegmonous inflammation there is a circumscribed swelling; in erysipelas little or none. The pain in erysipelas is of a burning kind; in phlegmonous of an acute throbbing nature. When erysipelas terminates in suppuration, the pus is not confined to one spot as in phlegmonous, but travels from cell to cell through the cellular membrane, which separates in sloughs resembling wetted tow.

Q. How would you treat a wound occasioned by glass?

A. As small spiculæ of the glass in general remain in these wounds without our being able to remove them, it is in general most proper to apply a poultice as in contused wounds.

Q. From how many causes may mortification proceed?

A. From the excess or peculiarity of preceding inflammation; from an interruption in the circulation of a part; by pressure on its principal vessels either preventing the flow of blood to, or its return from it; from external violence; intense heat or cold, or long continued pressure.

Q. How are wounds penetrating the thorax to be treated?

A. Where there is merely an incision through the parietes of the chest, the edges of the wound are to be brought and retained in contact by adhesive strips, aided by a compress, and a bandage round the thorax; perfect rest is to be enjoined, together with a strict antiphlogistic regimen; occasional bleedings will be proper to prevent inflammation arising to any considerable extent. Should violent inflammation, nevertheless, come on, copious bleeding, blisters, and all the remedies proper in pleurisy, are to be immediately employed.

Q. Previously to bringing the edges of the wound in contact, is it necessary to evacuate the air from the cavity of the pleura?

A. No: Experience and actual experiment have proved that air admitted in the thorax is not productive of those injurious effects which it was once supposed to be.

Q. What is the proper treatment for mortification arising from inflammation?

A. The great business of the surgeon should be rather to prevent the occurrence of mortification, by carrying the depleting remedies as far as the system of the patient will allow; when, however, mortification has actually come on, and the patient sinks, a judicious cordial regimen, with tonics, will be required. The best local application appears to be, according to the experience of Dr. Physick, a blister, of sufficient size to extend to the sound parts in contact with that in which the mortification is seated; where this, however cannot be applied, a common poultice, combined with powdered charcoal, or the fermenting poultice, are to be employed.

Q. What is the nature of gun-shot wounds?

A. They partake of the nature of contused wounds; the parts forming the sides of the wound being in general killed by the ball, they must be thrown off in the form of sloughs, before the wound can heal. These wounds likewise frequently contain portions of clothing, splinters, and the ball, &c.

Q. What is the mode in which a gun-shot wound should be treated?

A. Any extraneous substances, such as the ball, &c. that can be perceived, and removed with ease, should be extracted; but as these are generally in contact with dead matter, and will therefore be productive of no inconvenience, but will be removed with the sloughs, it is not necessary or proper to dilate the wound, or use much exertion in order to extract them: the common poultice is the most proper application to the wound, until the sloughs separate, when the sore is to be treated by the adhesive strips. The separation of sloughs should be carefully watched, as it frequently happens that the coats of a large artery have been killed by the

ball; and when the dead parts separate, profuse hæmorrhages will be liable to occur, unless attention be paid to this circumstance. When a limb has been torn off by the ball, the shattered extremity should be immediately amputated.

Q. If blood be effused in the chest from a wound, what is to be done?

A. The blood is to be evacuated. If the original wound be too small for this purpose, it is to be dilated with a scalpel; afterwards, the edges of the wound are to be placed accurately in contact, and kept so by adhesive plaster.

Q. How is hæmorrhagy from one of the intercostal arteries to be commanded?

A. The artery is to be dissected down to, and a ligature may now be carried round it, by means of a needle secured in a small curved forceps, as invented by Dr. Physick for taking up deep-seated vessels.

Q. How are gun-shot wounds of the thorax and lungs to be treated?

A. Blood should be drawn to a considerable extent, and a poultice of bread and milk, secured in a fine muslin bag, is to be applied upon the orifices made by the ball, until the sloughs separate.

Q. In what manner do wounds of the thorax occasion emphysema?

A. In general, by the lung being wounded, and the air which escapes into the chest, being incapable, from the obliquity, or the small size of the exterior opening of the wound, to pass externally, is forced into the cellular membrane, which it distends, sometimes only in the vicinity of the wound, but at others, in its whole extent over the body.

Q. What is the proper treatment of emphysema?

A. Punctures with a lancet in the vicinity of the wound; but if these do not prove effectual, a free incision must be made into the thorax, which at once puts a stop to the complaint.

Q. What are the general symptoms of a fracture?

A. Sudden pain at the time of the accident; deformity, or a change in the figure of the part, with an incapability of performing its functions without pain to the

patient; crepitation, or a grating noise caused by rubbing together the fractured extremities of the bone; and, if in a limb, in general, a shortening of it, and a capability of bending it at the place of fracture.

Q. How would you treat a wound penetrating the abdomen?

A. After ascertaining that none of the viscera had been wounded, I would place the edges of the wound, if it be made with a sharp instrument, in contact, and retain them so by the interrupted suture, passing the needle from within outwards, and by placing the body in such a position as shall most effectually relax the abdominal muscles. Inflammation is to be prevented from supervening, by the usual depleting remedies, confining the patient, at the same time, to a strict antiphlogistic regimen.

Q. What are the properties of pus?

A. It is a fluid of the consistency of cream, composed of globules swimming in a fluid, which is coagulable by muriate of ammonia. It is of a light straw colour, perfectly free from any acrimony, and sinks in water without mixing with it.

Q. What do you mean by a fungous ulcer?

A. When the ulcer, in place of forming healthy firm granulations of a florid colour, and proceeding on regularly to cicatrization, throws up large flabby granulations, which rise considerably above the surrounding parts, and have no disposition whatever to cicatrize.

Q. What is the treatment proper for a fungous ulcer?

A. We should attempt, at first, to suppress the fungus by pressure, made by a roller, or by the adhesive strips; should this prove ineffectual, the different escharotics should be resorted to, varying them according to circumstances. The red precipitate, the nitrate of silver, burnt alum, blue vitriol, &c. have all been found beneficial. Should one not succeed, another should be substituted.

Q. How is a wound or rupture of the tendo achillis to be treated?

A. The foot is to be extended, and kept so by means of a splint secured on the instep by a roller; the ine-

qualities of the leg being filled up by compresses. The edges of the divided tendon must be placed accurately in contact, and if a fold of the skin is found to insinuate itself between the divided ends, this must be prevented by the proper application of a portion of adhesive plaster.

Q. What symptoms would induce you to suppose an artery wounded?

A. If the vessel be of any size, there would be an immediate stream of blood of a bright scarlet colour, which is thrown out per saltum, or, as it were, by irregular jirks.

Q. What is meant by cicatrization?

A. It is that process by which, after any loss of substance has been supplied by granulation, an ulcer or wound heals; or, in other words, by which the production of new skin over a wound or ulcer is effected.

Q. What are the circumstances of a fracture of the bones of one of the extremities that would induce you to recommend immediate amputation?

A. The principal arteries of a limb being destroyed, the bone being ground, as it were, into many different pieces, and accompanied with a contused wound of the soft parts, as in the case of a large body falling on a limb, or of a broad heavy wheel passing over it; the bones constituting a joint being crushed; the fracture being complicated with a luxation of one of the larger joints, are circumstances that should induce a surgeon to recommend immediate amputation, provided inflammation had not taken place.

Q. What are the symptoms that would induce you to suppose a luxation of a bone had taken place?

A. Pain, and inability to move the member, a change in the length of the limb, and in the form of the joint.

Q. What is meant by granulations?

A. They are exudations of coagulable lymph from the vessels of the exposed surface, which soon become organized, and uniting together, supply any loss of substance produced by the ulcerative process. They are of a florid red colour, and contain vessels, nerves, and absorbents.

Q. What is meant by a compound luxation?

A. A luxation complicated with an external wound of the soft parts, communicating with the cavity of the joint.

Q. What is meant by a hernia?

A. The protrusion of some of the viscera of the abdomen through its parietes.

Q. What do you mean by crural hernia?

A. When the viscera pass out under the crural arch, or Poupart's ligament. It is likewise sometimes called femoral hernia.

Q. What is meant by hernia congenita?

A. A hernia occurring at or soon after birth, in which the intestines pass through the opening at which the testicle escapes from the abdomen; the tunica vaginalis testis constituting the hernial sac.

Q. What do you understand by inguinal hernia or bubonocele?

A. When the viscera escape from the abdomen at the abdominal ring.

Q. When the intestinal sac contains only intestine, what is it named?

A. Enterocele.

Q. What is the hernia called when the viscera pass through the umbilicus?

A. It is called exomphalos or umbilical hernia; and sometimes omphalocele.

Q. When the sac contains omentum only, what is it called?

A. Epiplocele.

Q. What do you mean by reducible hernia?

A. When the protruded viscera can be readily passed back into the abdomen.

Q. What is meant by strangulated or incarcerated hernia?

A. When the tumor cannot be reduced, in consequence of the parts about the orifice at which the viscera protrude, forming a stricture round the neck of the sac.

Q. What do you mean by oscheocele?

A. When the tumor in inguinal hernia extends to the scrotum it is thus denominated.

Q. Can a hernia be irreducible without being strangulated?

A. Yes; adhesions very frequently form, connecting the contents of the sac to each other, and also to the sac, and preventing their repassage into the abdomen.

Q. When the sac contains both omentum and intestine, what is it called?

A. Entero-epiplocele.

Q. What is the mode, generally speaking, in which dislocations are reduced?

A. By extension and counter-extension.

Q. What is meant by these terms?

A. By extension is meant that force which is applied to the dislocated bone, to draw it out of its unnatural situation: by counter-extension, the force applied to prevent the bone to which the luxated one is articulated, from being moved by the extending force.

Q. What are the principal obstacles to the reduction of a luxated bone?

A. The action of the muscles is the most considerable; difficulty is also sometimes occasioned by the head of the bone having passed over, or hitching on some bony prominence in the neighbourhood of the joint.

Q. By what means are these obstacles to be overcome?

A. The resistance of the muscles may be overcome, where the constitution of the patient will admit of it, by copious bleeding, as recommended by Dr. Physick, or by nauseating doses of emetics, or the tobacco clyster. The other obstacle is to be overcome by a proper direction of the extending force, or by lifting the head of the bone out of the position into which it has passed.

Q. What are the symptoms of concussion of the brain?

A. At first, there is insensibility, coldness of the extremities, difficulty of breathing, but without any stertor, and an intermittent pulse. The pupil of the eye is either dilated or contracted. In general, the respiration and pulse, after a time, gradually become more natural, and the extremities regain their warmth; the patient, though

still stupid, is sensible, if his skin be pinched, and becomes able to answer questions put to him in a loud tone of voice; and a vomiting frequently occurs.

Q. What is the great danger to be apprehended from a concussion of the brain?

A. The occurrence of an inflammation of that organ, when a re-action of the vessels takes place.

Q. What is the treatment for a concussion of the brain?

A. When called in, soon after the occurrence of the accident, all ligatures should be removed from about the patient's neck; his head is to be shaved, and cloths wrung out of cold water applied to it, and renewed as they become warm; as soon as the patient is capable of swallowing, a mercurial cathartic should be administered, and, if tardy in its operation, this should be accelerated by a dose of the infusion of senna. As soon as the pulse and system of the patient rises, bleeding is to be resorted to, and repeated as often as the pulse shows any tendency to rise. Blisters are at the same time to be applied to the head and back of the neck; and the patient is to be confined to a strict antiphlogistic regimen.

Q. How should a wound of the stomach be treated?

A. After removing any extraneous matter which can be discovered in the vicinity of the wound, without much disturbing the parts, the wound in the stomach is to be secured by a sufficient number of stitches, and the stomach returned into the abdomen, the ligatures being cut off close to the knot. Afterwards the external wound is to be closed by the interrupted suture. The occurrence of any undue degree of inflammation and fever, is to be guarded against by bleeding, &c. and the antiphlogistic regimen.

Q. What becomes of the portions of thread left in the wound of the stomach?

A. A layer of coagulable lymph is thrown over them, externally, which prevents them from escaping into the cavity of the abdomen, when separated by ulceration; they pass, therefore, into the canal of the intestines, and are evacuated with the fæces.

Q. What are the symptoms of an indolent ulcer?

A. A high, indurated, smooth, and rounded edge; imperfectly formed pus; smooth glossy granulations. The bottom of the ulcer is level, and here and there is of a white colour, from the adhesion of portions of coagulable lymph.

Q. What is the treatment proper for an indolent ulcer?

A. Almost all the escharotic and stimulating articles of the materia medica have been recommended in the treatment of this ulcer; most of them, in different cases, have been found beneficial, and they may be employed according to circumstances. When one is found ineffectual, or to aggravate the ulcer, it should be changed for another. Dr. Physick has very successfully treated this species of ulcer, by completely destroying the edges and surface of the sore with the knife or caustic. He in general prefers the latter. Dr. Baynton has introduced a mode of treating indolent ulcers, which is very generally adopted in conjunction with the employment of the remedies already mentioned. This practice is to apply adhesive strips over the ulcer, so as to draw its edges somewhat together, and afterwards, to envelope the extremity in a cotton roller.

Q. Recite some of the applications most generally employed in the treatment of indolent ulcers.

A. The red precipitate and corrosive sublimate of mercury; blue and white vitriol; caustic potash; the carbonates of soda and of potash; sulphuric, nitric, and muriatic acids; gastric juice; alcohol; rhubarb, &c.

Q What are the symptoms of aneurism?

A. It commences with a throbbing and a tumor at the seat of the disease, which is entirely free from any inflammatory symptoms. The tumor gradually augments in bulk, until it sometimes acquires a very considerable size. It may, at first, be made to disappear by pressure, but returns immediately upon the removal of the pressure. The subsidence of the tumor may also be produced by pressure upon the artery between it and the heart. The tumor augmenting in bulk, the pulsation becomes less, and sometimes is even entirely suspended.

If the aneurism be seated in a limb, and is of some size, a numbness and œdema of the parts below the tumor, are very frequently occasioned by its pressure upon the nerves and vessels.

Q. How do aneurisms terminate when left to themselves?

A. By the pressure of the tumor, an absorption of the surrounding parts takes place, and the aneurism is allowed room to enlarge itself; at length, however, the coats of the sac are thinned by the absorbents, and a slough forms, or they give way from some extraordinary exertion, and an immense gush of blood following, puts an end at once to the life and sufferings of the patient.

Q. What is the general treatment of a fractured extremity?

A. The limb is to be placed in such a situation as most effectually to relax its muscles; extension and counter-extension is now to be made, and the ends of the bone being placed in contact, are to be retained so by the application of splints and bandages. If inflammation has occurred to any extent previously to the arrival of the surgeon, it is better, before attempting to set the fracture, to wait until it subsides, employing, in the mean time, the proper remedies to combat it. Too great a degree of inflammation arising during the healing of the fracture, is to be treated by bleeding; and if in an upper extremity, by purging. When there exists extensive ecchymosis, copious depletion and cold applications will prevent the occurrence of an abscess.

Q. In cases of fractures occurring in intemperate habits, is there any modification of treatment necessary?

A. Yes: any considerable accident occurring in such habits, is apt to induce spasm, or even delirium and death. To guard against these consequences, the patient must be allowed, regularly, a proper quantity of spirituous liquors, graduated according to his former habits, and he is to be kept on rather a nourishing diet. It should also be recollected, that these patients will not bear any degree of depletion.

Q. Supposing the fractured bone will not take on bony union, as is sometimes the case, but still continues to bend at the place of the accident, what can be done?

A. If, after nine or ten weeks, it is found that no union has taken place, the surgeon should endeavour to excite a proper degree of inflammation in the part, by forcibly rubbing the fractured extremities together, and afterwards replacing the dressings as at first. This will sometimes succeed, but if it should not, the operation introduced by Dr. Physick, of passing a seton between the fractured ends, extension and counter-extension being made at the time, is to be performed. The seton is to be kept in until bony union commences.

Q. How are wounds of the joints to be treated?

A. The limb must be placed, and if possible, by proper splints and bandages, retained, in such a position as shall favour the approximation of the edges of the wound. Adhesive strips are to be applied, but no suture should be employed. Absolute rest, and a strict adherence to an antiphlogistic regimen, are to be enjoined. As the most distressing consequences are to be apprehended from inflammation occurring in a joint, every exertion should be made to prevent it. If any symptoms of it occur, bleeding is immediately to be resorted to, and carried as far as the patient's constitution will permit. Topical bleeding by leeches, or cupping, is next to be employed, and followed by the early application of a large blister to the joint; and the patient must be confined to a low diet.

Q. When inflammation has occurred in a joint, and notwithstanding our remedies, from its violence and long continuance, an anchylosis is apprehended, what is to be attended to?

A. To place the limb in such a position as shall be most convenient to the patient, when anchylosis has actually taken place. Thus, when the part affected is the elbow, the arm is to be kept flexed; when the hip or knee, the limb must be preserved in a state of extension.

Q. What are the symptoms of a compression of the brain?

A. In general there is a complete loss of sense, speech, and voluntary motion, with stertorous breathing, and a dilatation of the pupils, which cannot be altered by the

strongest light; the pulse is slow and irregular, and the limbs are in a state of relaxation.

Q. From how many causes may compression of the brain arise?

A. Either from an effusion of blood within the cranium, or from the depression of a portion of the scull.

Q. How may compression from effused blood be distinguished from concussion?

A. The discrimination is sometimes very difficult. In forming a judgment, it is to be recollected that the symptoms of concussion always follow immediately on the receipt of the injury, and the patient gradually recovers from the state of insensibility in which he at first was; when, therefore, any time has elapsed between the accident and the occurrence of the symptoms of compression, or if, after recovering from the first effects of the concussion, symptoms of compression come on, we may conclude, with some degree of certainty, that the symptoms are caused by effused blood within the cranium, and we should proceed accordingly.

Q. What is proper to be done in such a case?

A. To remove a portion of the scull with the trephine, in order to permit the evacuation of the blood.

Q. At what part of the scull are we to perform this operation?

A. If the spot, at which the injury that induced the extravasation was inflicted, can be ascertained, this will be the proper place for the perforation. If this cannot, however, be done, the perforation should be made over the course of the middle artery of the dura mater, at the anterior inferior angle of the parietal bone. If, after perforating one side of the head, no collection of blood is discovered, the operation is to be repeated on the opposite side.

Q. How may femoral be distinguished from inguinal hernia?

A. In the former, the whole extent of the angle of the pubis and the whole length of the crural arch can be felt, which is not the case in the latter. The neck of the hernial sac in the latter, also, may be traced to the abdominal ring.

Q. What are the symptoms that indicate the existence of strangulation in hernia?

A. There is an insuperable costiveness, acute pain in the tumor, particularly at the place of stricture, and extending from thence over the abdomen, which soon swells and becomes tense. The pain, which was not at first constant, becomes fixed, and is augmented by pressure and by coughing, sneezing, &c.; nausea and vomiting come on. The matter thrown up is at first the contents of the stomach, but afterwards becomes fœcal; the pulse is quick and hard, and the extremities are cold; the patient becomes affected with hiccup, and his pulse is now scarcely perceptible; his respiration is weak, and his whole body is covered with a cold clammy sweat. Mortification now takes place in the contents of the tumor, which extending, puts a period to the life of the patient.

Q. How would you distinguish inguinal hernia from hydrocele?

A. In the latter, the swelling commences at the bottom of the scrotum and extends upwards, in place of commencing at the ring, as in inguinal hernia, and proceeding downwards. Hydrocele is not dilated, as is hernia, by coughing, and appears transparent, when examined opposite a candle; the spermatic chord, which, in inguinal hernia, is easily distinguished behind the tumor, cannot at all be felt in hydrocele.

Q. What are the symptoms of reducible hernia?

A. The swelling is soft, free from pain, and of the natural colour of the skin; the parts are readily returned into the abdomen; the tumor is larger in an erect than in a recumbent posture, and is enlarged by coughing, sneezing, vomiting, straining at stool, &c.

Q. How may femoral hernia be distinguished from lumbar abscess, when the latter appears in the groin?

A. If the patient be laid upon his back, and pressure be made with one hand upon the tumor, and the other upon the abdomen, if it be an abscess a fluctuation will be felt, which cannot be produced in a hernial tumor. The history of the case likewise will assist us in determining the nature of the swelling.

Q. How is strangulated hernia to be treated?

A. We should endeavour to return the parts as speedily as possible into the abdomen, provided they are free from gangrene. This is to be attempted by placing the patient on his back, with his hips and shoulders raised; and the thighs, if it be an inguinal or femoral hernia, are to be bent on the pelvis, and at the knees, and also rolled inwards. The surgeon should now attempt, by gentle and judiciously directed pressure, with the hand, to reduce the tumor; if this be unsuccessful, blood is to be drawn from the arm until symptoms of fainting ensue, and the efforts to reduce the tumor should be now repeated. The parts still refusing to pass into the abdomen, the warm bath, if at hand, should be resorted to, and the taxis again repeated; this proving unsuccessful, cold may be applied to the tumor, and in case of its failure, recourse should immediately be had to the tobacco injections. If all these means fail, the surgeon must lose no time, but immediately operate.

Q. In what direction should the taxis be made in our attempts to reduce femoral hernia?

A. At first directly downwards, as though we were pressing the tumor into the thigh, and when its surface is reduced to a level with the crural arch, we are then to press it upwards towards the abdomen.

Q. Why should the taxis be applied thus?

A. This will be very evident, when it is recollected that the direction of the contents of the hernia, in escaping from the abdomen, is at first downwards, until they protrude from under the crural arch, when they pass directly forwards. If, therefore, we were at first, in place of pressing the tumor, as it were against the thigh, to push it towards the abdomen, it would, in place of passing into that cavity, turn up over the edge of the arch, and no degree of force applied in that direction could possibly reduce the hernia.

Q. In what direction are we to apply our force in the reduction of inguinal hernia by the taxis?

A. Obliquely upwards and inwards, in the direction of the abdominal canal.

Q. How would you treat a dislocation of the inferior jaw?

A. The patient being seated on a low stool, his head is to be supported by an assistant behind. The surgeon wrapping around his thumbs the ends of a towel, places them as far back as possible upon the molar teeth, and while he forcibly depresses these, with his fingers placed beneath the chin, he elevates the fore part of the jaw; as soon as he finds the jaw to move, he pushes it a little backwards, and at the same time slips his fingers between the teeth and cheeks, lest they be bitten by the jaw, which, at the moment of its reduction, closes with considerable force. The jaw is to be retained in its position by a bandage passed over the head and under the chin, and the patient is to be nourished for some time on spoon victuals.

Q. How is a compression of the brain, from a fractured cranium, to be treated?

A. By removing, with the trephine, the depressed portion of bone, and guarding against inflammation by proper depletion.

Q. What are the principal cautions necessary in performing the operation of trephining?

A. 1st, in making the incision through the scalp to guard against plunging the knife, through the fracture, into the brain; 2d, always to apply the centre pin of the trephine upon a firm portion of the cranium: 3d, to recollect to retract the centre pin, after a sufficient groove has been formed for the crown of the instrument; 4th, frequently to ascertain, with a tooth-pick, the depth to which the saw has penetrated, being careful that it has not arrived in any portion of the groove at the dura mater; 5th, when the trephine has reached the tabula vitrea, rather to break out the piece of bone by the elevator, than to cut completely through with the saw.

Q. Does every case of fractured cranium require the application of the trephine?

A. The trephine is to be employed in no case of fractured cranium, excepting in those accompanied with symptoms of compressed brain.

Q. How would you treat a fractured rib?

A. By applying a broad bandage around the thorax, as tightly as the patient can bear, in order to prevent the action of the ribs in respiration displacing the fractured

edges. Undue inflammation is to be counteracted by the usual depleting remedies; if the patient be troubled with a cough, he must make use of some demulcent mixture.

Q. What is the treatment proper in a case of ophthalmia?

A. Bleeding, general and topical, and purging with the saline cathartics, carried to such an extent as the violence of the symptoms shall demand. After bleeding, a blister is to be applied to the temples, or behind the ears; the antimonial powder will also be proper. The patient must be confined to a dark room, and kept on a strictly antiphlogistic regimen. In the first stage, simple cold water, or milk and water, may be applied to the eye by means of cloths wet with them, and frequently renewed; at a latter stage, these should be changed for a collyrium composed of a proper proportion of sugar of lead and white vitriol dissolved in water. If the inflammation continue notwithstanding our remedies, a salivation should be induced by the active use of mercury both externally and internally.

Q. What do you mean by a cataract?

A. An opacity of the crystalline lens, or of its capsule, or of both.

Q. What do you understand by a hare lip?

A. A congenital deformity, consisting in a fissure of the upper lip, varying in its extent.

Q. How is it to be treated?

A. A portion of the edges of the fissure, of the form of the letter V inverted, is to be removed by means of sharp scissors. The edges are now to be placed in contact, and two silver pins passed through both sides of the wound, entering and bringing them out about half an inch from it. A waxed ligature is next to be twisted round each pin in the form of the figure 8, in such a manner as to retain the edges in contact.

Q. What is meant by a polypus?

A. It is a fleshy tumor, originating from the inner parts of the different cavities, varying in its size and nature.

Q. What symptoms result from wounds of the abdominal viscera?

A. Profuse hæmorrhages, the escape of the contents of the different viscera, a small, feeble, and contracted pulse, pallid countenance, coldness of the extremities, great prostration of strength, hiccough, vomiting, tension of the abdomen, and spasm.

Q. When, after the operation of trephining, the dura mater is protruded through the opening by blood effused between it and the pia mater, what is to be done?

A. If the tumor is considerable, and we are assured, from circumstances, that it contains fluid blood, a small puncture may be made through the membrane with a sharp lancet to let it out; but, from the danger resulting from wounds of the dura mater, we should, except under the above circumstances, trust to the removal of the effused fluid by the absorbents, at the same time bleeding and purging the patient actively, confining him to a very abstemious regimen, and enjoining perfect rest.

Q. What is meant by a hydrocele?

A. The term is generally made use of to signify a morbid collection of water in the tunica vaginalis testis.

Q. What are the appearances of a hydrocele?

A. It is a pyriform, somewhat tense and elastic tumor, in which a fluctuation can in general be felt. It is somewhat transparent when held before the light; the skin retaining its natural colour.

Q. How may it be distinguished from an anasarcous swelling of the scrotum?

A. The latter is generally a symptom of universal dropsy. The tumor, in place of being tense, is doughy to the feel, and any impression made in it remains for some time; the swelling is not confined to the scrotum, as in hydrocele, but also extends to the penis. In hydrocele, the testicle can be felt at the inferior posterior part of the tumor, but in anasarca of the scrotum, they are imbedded in the centre of the swelling, and cannot be distinguished.

Q. How is hydrocele is to be treated?

A. To relieve the inconveniency arising from the bulk and weight of the tumor, the water may be drawn off, through a puncture, with a common lancet; this, however, is only palliative, and the water again speedily

collects. To effect a radical cure, after drawing off the water by a trocar and canula, wine diluted with water must be injected through the canula into the cavity of the tunica vaginalis, so as to distend it, and retained there until pain is experienced in the back and loins, when it is to be permitted to run off. Should too great a degree of inflammation arise, bleeding, &c. is to be resorted to.

Q. What are the cautions requisite in performing this operation?

A. 1st, to ascertain the exact situation of the testicle, in order to avoid piercing it with the trocar; and 2d, by pincing a fold of the skin, surrounding the opening made in the scrotum, between the finger and the guard of the canula, to prevent the canula from slipping out of the cavity of the tunica vaginalis testis; otherwise, the cellular membrane of the scrotum may be injected with the wine, and mortification ensue. Previous to determining on the operation, we should also be certain that the testicle is free from disease.

Q. How does the injection of the tunica vaginalis testis effect a radical cure of hydrocele?

A. By exciting inflammation throughout the cavity, which causes an adhesion of its sides to take place.

Q. What are the symptoms of an inflammation of a vein consequent to venesection?

A. There is, at the orifice made by the lancet, a hard painful tumor, from which an erysipelatous redness extends to some distance around. Flexion and extension of the arm are productive of much pain to the patient.

Q. What is the cause of this affection?

A. In general, inattention on the part of the surgeon, in not closing the orifice made in the vein by the lancet, so that it shall unite by the first intention.

Q. How is the disease to be treated?

A. On its first appearance, Dr. Physick recommends the application of a blister, large enough to cover all the inflamed parts. A portion of adhesive plaster is to be put on the orifice in the vein, previously to the application of the blister. If, however, the inflammation is considerable, and fever arises, bleeding, purging, and the antiphlogistic regimen must be had recourse to; at

the same time keeping the arm at rest by means of a splint. Dr. Hunter advises compresses to be applied so as to induce an adhesion of the sides of the vein at the inflamed part, or, if suppuration has commenced, above the suppurating part.

Q. How is a fracture of the neck or head of the humerus to be distinguished from a dislocation of that bone into the axilla?

A. In both there is a depression at the upper and fore part of the arm. In the dislocation, this depression is immediately beneath the acromion scapulæ, and the shoulder is flattened; but in the fracture it is lower down, and the shoulder retains its rotundity. In the dislocation, the round head of the bone can be distinguished high up in the axilla; in the fracture, in place of it, we feel the rough edge of the fractured bone, and by moving the arm crepitus may be induced.

Q. What is meant by a hæmatocele?

A. A swelling of the scrotum, occasioned by blood, effused either in the cellular membrane, or in the cavity of the tunica vaginalis.

Q. How is scrotal hernia distinguished from hæmatocele?

A. By the firmness of the tumor in the latter case, its being accompanied with a dark redness of the skin, its not being dilated upon coughing, and by there being no swelling in the course of the spermatic chord.

Q. How is hæmatocele to be treated?

A. We should endeavour to induce an absorption of effused blood by cold applications; the affusion of cold water upon the swelling; by a due degree of pressure by a proper bandage, and by the occasional administration of purgatives.

Q. How is a fractured clavicle to be managed?

A. In order to reduce the fracture, and preserve the fragments in such a position as they shall unite without deformity, it is necessary the shoulder be kept outwards, upwards, and backwards; to effect this, the patient is to be placed on a seat without a back, and his arm, on the affected side, being raised by an assistant, and held at a right angle with the body, a pad, made in the form of a wedge, about three inches thick at its

base, is to be placed in the axilla, with the thickest end uppermost, and secured there by a roller passed round the thorax. The fore arm being half bent, the surgeon is now to take hold of the elbow, and press the arm close down over the pad, at the same time pushing the humerus upwards, and its upper extremity a little backwards. The arm is to be secured in its present situation by a bandage passed round it and the thorax, to extend from the shoulder to the elbow, and the shoulder is to be kept elevated by a bandage, which, commencing at the sound axilla, is to be passed over the breast, across the injured shoulder, along the posterior part of the arm, and around under the elbow; from hence it is again to be carried obliquely across the breast to the sound armpit, then across the back over the injured shoulder, and in front of the arm to the elbow, thence it is to be passed across the back to the spot from which it originally started, and to commence its course anew. The dressings are to be frequently examined, and renewed when they become loose.

Q. Why is the humerus more frequently dislocated than any other bone?

A. From the very superficial cavity into which the head of the bone is articulated, from the laxity of the ligaments of the joint, and from the great extent of its motions, exposing it to frequent accidents.

Q. What are the symptoms of the formation of a cataract?

A. The disease is in general very slow in its approach. The first symptom is an appearance, to the patient, of small motes or films floating before the eye; at this period the eye does not present to the sight any alteration in its appearance. The disease advancing, all objects appear to the patient to be obscured by an apparent mist, and his vision gradually becomes more and more impaired, until he is at length unable to discern the objects around him, although he may be able to distinguish the situation of a strong light, or of the windows in a room. A turbid whiteness is at first perceived in the lens, which increases until a perfect opacity takes place.

Q. What is the proper treatment in the incipient stage of cataract?

A. We should endeavour to prevent the further progress of the disease, by resorting to the usual depleting remedies, bleeding, purging, blisters, mercury, setons, and issues, together with a low diet; and the depletion should be carried to such an extent as the patient's constitution will allow.

Q. What are the symptoms in cataract that would induce us to prognosticate a favourable result from an operation?

A. When it occurs in a person of a sound constitution; is unconnected with any other disease of the eye, and has not originated from an external violence; when the pupil freely contracts on exposure to light, and when it is not more dilated than it would naturally be in a similar degree of light; when the patient is free from pains in his head, eyes, or eyebrows; and when he still retains the power of discriminating vivid colours, and the outlines of such bodies as are presented to him.

Q. What is meant by a ranula?

A. A tumor, situated under the tongue, consisting of a sac containing a thick glairy fluid, and sometimes a calculous concretion.

Q. How is it to be treated?

A. The best mode is, in general, to pass, by means of a curved needle, a seton through the tumor, where it is to be left until inflammation and suppuration of the cavity take place.

Q. How would you remove a portion of the tongue?

A. By passing a double ligature, by means of a needle, through the tongue, beyond the part to be removed; one of the ligatures is now to be tied on each side, and the included portion being deprived of its circulation, will in a short time drop off.

Q. How should hernia humoralis be treated?

A. The patient should be confined to a horizontal position, and his testicles should be supported by a proper bandage; leeches are to be applied to the part, and if the symptoms are violent, bleeding from the general system should be resorted to, and repeated according to

circumstances. Saline purgatives are to be administered, and cold applications applied to the tumor. If a hardness remain after the inflammation has subsided, frictions with mercurial ointment will be proper. In some cases of hernia humoralis, the repeated introduction of the bougie has been found beneficial.

Q. What is the appearance of the sac in inguinal hernia upon dissection?

A. After cutting through the skin and cellular membrane of the scrotum, a fascia, which is a production of the tendon of the external oblique muscle, presents itself, varying in thickness, according to the extent and continuance of the hernia; beneath this fascia, is the cremaster muscle, thicker and more extended than natural, forming another covering to the sac; after cutting through this, we come to the proper hernial sac, which is an elongation of the peritonæum, but rather thicker than natural.

Q. On opening a hernial sac, what would induce you to conclude the intestine mortified?

A. If it appear of a dark purple or leaden colour, and the blood, on being pressed out of the part by the finger, does not return, we may conclude it to be mortified.

Q. Where is the humerus most frequently fractured?

A. Near its middle.

Q. When, in consequence of a wound in the cheek, the parotid duct is opened, what takes place?

A. If great care be not taken to close the external orifice of the wound, a fistulous opening is formed, through which the saliva, in place of passing into the mouth flows out over the cheek.

Q. How is salivary fistula to be treated?

A. We at first enlarge the natural orifice of the duct, by passing into it a silver probe, and after withdrawing the probe, introduce a small tube, which is also to pass into the orifice of the duct through which the saliva is discharged; the external edges of the wound being made raw, are now to be brought together in order that they may unite. In some cases, in place of the above treatment it is necessary to form a new canal for the saliva to pass through into the mouth, by passing a

needle obliquely from the bottom of the fistula into the mouth, and allowing a seton to remain in the orifice thus made, until its sides become callous.

Q. What is meant by circocele?

A. It is a varicose distension of the spermatic veins in the scrotum.

Q. How may circocele be distinguished from scrotal hernia?

A. The patient being laid upon his back, the blood is to be pressed out of the enlarged veins, after which the finger is to be placed firmly upon the abdominal ring, and the patient desired to rise. If it be a hernia, the tumor will not return until the pressure is removed; but if a circocele, the swelling will in a short time become greater than before, in consequence of the passage of the blood through the veins being interrupted.

Q. How many kinds of stricture are liable to take place in the urethra?

A. Two; a spasmodic and a permanent; they may both be combined; a permanent stricture taking on spasm.

Q. How are strictures of the urethra to be treated?

A. Either by dilating them with a bougie, or destroying them with caustic.

Q. How is the application of caustic to be made to strictures in the urethra?

A. By securing on the end of a bougie a portion of lunar caustic; a common bougie is first to be introduced, in order to ascertain the exact depth at which the stricture is situated; and this is to be marked on the armed bougie, which, after being oiled, is to be passed into the urethra down to the mark, and retained in contact with the stricture for a minute or so. The application of the caustic may be repeated in the course of twenty-four hours.

Q. From how many situations may the bladder be punctured?

A. From above the pubes, from the perinæum, or, in males and the unimpregnated female, through the rectum.

Q. When is tapping of the bladder necessary?

A. Whenever the urine cannot be evacuated by any other means.

Q. What arteries are most subject to aneurism?

A. The aorta at its curve, and the popliteal.

Q. What is the nature of a varicose aneurism?

A. A puncture being made through the coats of a vein, and into an adjoining artery, and the communication thus made between the vein and the artery not being closed, blood from the latter is thrown into the vein, which dilates, forming a considerable tumor, which is the varicose aneurism. It has a pulsating jarring motion; and a hissing noise may be heard in it, occasioned by the arterial blood passing through the orifice into the sac.

Q. What is the danger to be apprehended in cases of fractures of the humerus in the vicinity of its condyles?

A. The occurrence of a deformity at the elbow joint, consisting in the angle at the bend of the elbow being projected upwards, in place of sloping downwards, as it naturally does.

Q. What is the proper management of the fracture, in order to prevent this deformity?

A. Dr. Physick directs the fracture to be reduced, and a roller to be applied from the wrist to the shoulder; two angular splints are then to be applied, so as to keep the fore arm flexed at a right angle with the arm, and long enough to extend to the ends of the fingers. These are to be secured on by bringing down the roller over them. At the end of a week the splints are to be taken off, and the arm gently flexed and extended several times, in order to prevent any stiffness. The dressings are then to be re-applied as before. At the end of twenty days, the rectangular splints are to be laid aside, and splints forming an obtuse angle are to be substituted, and kept on until the fracture has united.

Q. How is a dislocation of the humerus downwards in the axilla to be treated?

A. The surgeon, if called soon after the occurrence of the accident, is to make counter-extension with one hand, against the acromion scapulæ, and with the other, grasping the arm near the elbow, he is to make extension. If this should not succeed, or some time has elap-

sed since the dislocation took place, the force is to be augmented, by making several assistants press against the acromion process, and the same number extend the arm. If the force that can be applied in this way be insufficient, a strong band, lined with buckskin, may be passed over the acromion, and confined in its situation, by passing a piece of muslin over it on each side of the arm, the ends of these being held by an assistant; this band for counter-extension may be fastened to a staple in the wall, or held by a number of assistants; a towel is now to be fastened above the elbow, by several turns of a roller; to this towel, bands may be attached, to be taken hold of by assistants, for the purpose of making extension, or it may be attached to pullies. These means should be aided by copious blood-letting, whenever the case will admit of it.

Q. Describe the operation for the extraction of a cataract.

A. The patient is to be placed on a seat, so situated, that the light shall strike the eye to be operated on, obliquely. The sound eye is to be covered with a compress, and the patient's head is to be supported by an assistant, placed behind him, who is also, with that hand which is at liberty, to keep elevated the upper eyelid, by pressing it in folds against the edge of the orbit. The surgeon being seated before the patient, so that his mouth shall be on a level with the patient's eye, is to draw down with one hand the under eyelid, and taking the cataract knife in the other, is to rest his fingers on the patient's temple, and, when the eye is steady, he is to push the knife into the cornea, about half a line distant from its connection with the sclerotica, and so high up, as that the incision, when completed, shall be sufficiently large for the escape of the opaque lens; the knife is to be carried on, with a steady hand, until it passes out on the side of the cornea opposite to that on which it entered, and the same distance from the sclerotica. The knife being pushed on, completes the incision. As soon as the knife has passed through both sides of the cornea, the eye must be permitted to close. In about a minute, the eyelids are to be separated, and a needle of a proper construction, attached to a handle,

introduced through the wound in the cornea, into the pupil, and by it the anterior part of the capsule of the lens is to be freely lacerated. A gentle degree of pressure being now made on the eye, the opaque lens will escape through the incision. On the eye being examined, if any opaque portions of matter remain behind, they are to be removed by the currette. If the capsule be found opaque, this is to be removed by a forceps. The patient, after the operation, is to be confined on his back for nine or ten days, in a dark chamber. The eye is to be covered with a compress; and, for fear of accidents, the patient's hands are to be secured down to his side. Inflammation occurring to any extent, will demand the usual depleting remedies.

Q. What is very frequently the consequence of a bone being denuded to some extent of its periosteum?

A. An exfoliation.

Q. What do you mean by an exfoliation?

A. The separating, by the absorbents, of a dead portion of bone from the living, in the form of scales or leaves.

Q. How may this be prevented?

A. In general, by immediately replacing the lacerated integuments, if they remain attached at any part, and retaining them in their situation by a soft compress.

Q. What are the symptoms of a suppression of urine?

A. A great desire, with an inability, to void the urine; pain in the region of the bladder, which latter gradually swelling may be felt forming a tumor above the pubes; at length, the abdomen becomes tense and painful; difficulty of breathing; hiccough, and cold sweats come on; and the bladder, unless evacuated, inflames, and finally mortifies.

Q. What are the causes of a suppression of urine?

A. Strictures in the urethra; stone in the bladder; hæmorrhoidal tumors; inflammatory and other swellings in the vicinity of the urethra; spasms of the neck of the bladder, or of the urethra; an enlargement of the prostate gland; inflammation and thickening of the neck of the bladder, &c.

Q. How would you treat a suppression of urine?

A. If it arises from a stone in the bladder falling on the orifice of the urethra, a change of posture in the patient will effect its removal; or if from a stone impacted in the urethra, this may be removed by a probe bent at the eyed end in the form of a hook; or, if this does not succeed, by cutting it out. If, however, the cause cannot be thus easily removed, I would bleed from the arm, administer a cathartic, place the patient in a warm bath, and administer a large dose of opium by the mouth, or an anodyne injection.

Q. Provided the suppression did not yield to this treatment, what would you do?

A. I would endeavour to introduce the catheter.

Q. What is meant by a lumbar abscess?

A. It is a collection of pus, commencing in the loose cellular membrane surrounding the psoæ muscles, and posterior to the peritonæum.

Q. Where does lumbar abscess in general point?

A. It, in general, travels down behind the peritonæum, until it arrives beneath Poupart's ligament, or at the upper and fore part of the thigh, where it forms a tumor, varying in size, in different cases. It sometimes points, however, in the middle of the thigh, or in the vicinity of the anus.

Q. What are the symptoms which generally precede the formation of this abscess?

A. There is a sense of weakness, with a dull pain in the loins; the thigh on the affected side becomes weak; the patient finds standing and walking difficult, and he bends the body forwards so as to relax the muscles.

Q. What is meant by a paronychia, or whitlow?

A. It is an inflammatory affection, seated at the end of the finger near the nail, attended with excessive pain, and terminating generally in suppuration.

Q. How many kinds or varieties of paronychia are there?

A. Four: the first is seated beneath the cuticle; the second beneath the true skin in the cellular membrane; the third in the theca of the tendons; and the fourth on the periosteum.

Q. What are the principal circumstances calling for an amputation of a limb?

A. Extensive compound fractures, attended with severe injury of the soft parts, or a destruction of the principal arteries of the limb; compound luxations of the larger joints, attended with extensive laceration, and contusion of the soft parts, particularly in hot weather; the limb being much shattered, or a part of it being torn off by a ball or splinter; extensive mortification affecting the extremity of a limb; certain diseases, as a scrofulous knee joint, attended with great prostration of strength, hectic fever, &c.; the fungus hæmatodes affecting a limb; caries of a joint, &c. &c.

Q. How many kinds of fistula in ano are there?

A. Three: viz. 1st, the complete, opening externally, and also into the rectum; 2d, the incomplete, with an external opening only; 3d, the occult, having an opening in the gut, but none externally.

Q. What is the cause of fistula in ano?

A. In general, they arise from phlegmonous tumors, situated near the anus, which, being allowed to suppurate, form abscesses, which are prevented from healing from the nature of the parts in which they are situated, and consequently become fistulous.

Q. What are the obstacles to the healing of abscesses seated in the vicinity of the anus?

A. The matter not being able freely to discharge itself, consequently keeps open the abscess, and excites an inflammation in its sides; the fæces passing into the abscess when it opens in the intestine, and not being permitted to escape; the external orifice of the abscess being closed, while the disease is continued within by the retained matter; and, lastly, the parts being prevented from remaining at rest, by the action of the sphincter ani muscle.

Q. Define a caries.

A. It consists in the ulceration of a bone; the bone becomes soft and loose, by the action of the absorbents; it is surrounded by fungous granulations, which bleed on the slightest touch, and there is an offensive and dark coloured discharge of a serous nature from the part.

Q. At what part of the urethra do strictures generally take place?

A. All parts of the urethra are occasionally affected with strictures, but their seat is most frequently in the vicinity of the bulb.

Q. How are fractures of both bones of the fore arm to be treated?

A. The arm being flexed, counter-extension is to be made by an assistant grasping the arm near the elbow, while another makes extension by taking hold of the patient's hand. The surgeon, after placing the fractured extremities in contact, applies a roller from the fingers up to the elbow; compresses being placed between the bones, two splints, long enough to extend from above the elbow to the very extremities of the fingers, and somewhat broader than the arm, in order to prevent the bandages from pressing the bones together, are to be applied, one on each side of the arm, the thumb being kept uppermost. The splints being confined on by bringing down over them the roller, the arm is to be supported in a sling passed over the shoulders.

Q. When, on opening a hernial sac, a large portion of indurated omentum is found in it, should it be returned into the abdomen?

A. No; the indurated portion is to be freely extirpated, and the bleeding vessels, being secured by ligatures, the remaining portion of the omentum is to be returned into the abdomen, keeping, however, the ligatures opposite the mouth of the sac.

Q. What are the causes producing hæmorrhoids?

A. Whatever prevents a free return of blood from the hæmorrhoidal vessels; as costiveness; tumors pressing on the rectum; pregnancy; enlargement of the abdominal viscera; prolapsus ani; and also the habitual use of drastic purgatives.

Q. How is true aneurism to be cured?

A. By passing a ligature around a sound portion of the artery in which the aneurism is seated, and at a distance from the tumor, so as completely to obliterate the cavity of the vessel.

Q. When the principal artery in a limb is tied, how is the circulation carried on?

A. The anastomosing and collateral branches become enlarged, and convey a sufficiency of blood for the nourishment of the limb.

Q. When, on opening a hernial sac, we find the intestine mortified, what are we to do?

A. We are directed, if the mortified portion be very small, and there is no opening in it, to return it at once into the abdomen; when an opening exists in the mortified part, to stitch it up, and then return the intestine into the abdomen; in both cases, keeping the part opposite the mouth of the sac, by means of a stitch passed through the mesentery, and through the mouth of the sac. If the whole cylinder of the intestine be mortified, it is to be allowed to remain in the sac; and if there be no opening in it, an incision is to be made into the mortified part, in order to give vent to the fæces.

Q. What are the causes of prolapsus ani?

A. A relaxation of the levator ani muscle; habitual costiveness, occasioning violent straining at stool; worms occupying the rectum; the frequent use of drastic purgatives; and hœmorrhoidal affections.

Q. How is the disease to be treated?

A. The prolapsed parts are to be reduced as soon as possible, by the fingers. If an inflammation has occurred in the protruded intestines, leeches are to be applied to the part; blood, if necessary, is to be drawn from the arm, and a cold poultice, with lead-water, is to be put on the swelling; all those circumstances which favour the occurrence of the disease, are carefully to be guarded against; and the cure is to be completed by a course of astringents and tonics. Dr. Physick recommends, in cases of prolapsus ani, a diet exclusively of rye mush and sugar or molasses. The patient to void his stools in a standing posture. By this mode of treatment he has been enabled to effect a perfect cure in several cases.

Q. What is the appearance of the sac, in femoral hernia, upon dissection?

A. Beneath the skin and cellular membrane, we meet with a fascia, covering the sac, given off by the external oblique muscle, and, in old hernias, much thickened; under it lies the fascia propria, as it has been called, of

the hernial sac, consisting of the union of a thin fascia, which naturally covers the femoral ring, and of the crural sheath; between this covering and the peritoneal sac, a quantity of adipose matter generally exists, which being removed, brings into view the proper sac of the hernia.

Q. How may a dislocation of the thigh upwards and backwards, be distinguished from a fracture of its neck?

A. In fracture the leg is shortened; the toes are in general turned inwards; the limb can be easily turned in many directions; and, by a particular motion, crepitus may be induced; when the fracture is reduced by extension and counter-extension, and the extending force is discontinued, it immediately returns to the position in which it was, before reduction. In the dislocation the toes are turned inwards, and cannot be turned outwards: a cavity is felt at the acetabulum, and a tumor is felt on the dorsum ilii, caused by the head of the bone: and when the dislocation is reduced it remains so.

Q. How is the operation for the relief of strangulated inguinal hernia to be performed?

A. The hair being shaved from the pubes, and the patient placed in a suitable situation, an incision is to be made, commencing about an inch above the ring, and extending, if the hernial tumor be not very large, to the very bottom of the swelling, so that the skin and cellular membrane investing the sac will be cut through. If, by this incision, the external pudic artery, which crosses the upper part of the sac, be divided, it may be secured by a ligature before we proceed further in the operation. A portion of the fascia, which is exposed by our first incision, is now to be raised with a pair of forceps, and divided so as to allow the introduction of a probe, on which the fascia is to be divided upwards to within an inch of the ring, and downwards to the bottom of the tumor. This opening through the fascia exposes the second covering of the hernial sac, viz. the cremaster muscle, which is to be divided precisely in the same manner, when the sac will be exposed. The surgeon is next to pinch up, by a pair of forceps, some of the cellular membrane, which adheres to the anterior and inferior portion of the sac: when the sac is thus raised and separated from the intestine, he is to place the edge

of the knife horizontally, and cautiously cut a small hole, just sufficient to admit the blunt end of a probe, or of a director, upon which the sac is to be divided upwards to within an inch of the abdominal ring, and downwards to the bottom of the sac. The next thing to be attended to is the division of the stricture; with this view, the finger is to be passed into the neck of the sac, as far as the stricture, which will be found either at the ring, or about an inch and a half from this aperture, inclining obliquely upwards and inwards, or else in the mouth of the sac. If the stricture be at the ring, a probe-pointed bistoury must be conveyed over the front part of the sac into the ring, the finger in the sac serving as a director, and by it the stricture is to be divided in a direction directly upwards, opposite the middle of the sac, and to an extent merely sufficient to allow the parts to be returned into the abdomen. By dividing the ring in this direction, the epigastric artery is in no danger of being wounded, and the transverse tendinous fibres not being divided, the ring is but little weakened. The stricture being removed, the contents of the sac, if not diseased, are to be returned into the abdomen.

Q. What is meant by the term ectropium and entropium?

A. By *ectropium* is meant an eversion or unnatural turning out of the eye-lids, so as to expose the ball of the eye. By *entropium*, an inversion or turning in of the eye-lids, so that the cilia rub upon and irritate the eye-ball.

Q. How are these affections to be treated?

A. In *ectropium* we should either remove the lining of the everted lid, and afterwards support the latter in its natural place, or cut out an angular portion of the lid in the form of a letter V, and about one third of an inch broad at its base. The edges of the wound are then to be brought in contact, and secured so by a stitch. The most effectual cure for the inversion of the eye-lid, or *entropium*, is the excision, by means of sharp scissors, of the everted portion of the lid, as recommended by Dr. Dorsey, being careful, in performing the operation, to avoid the puncta lachrymalia.

Q. What is meant by fistula lachrymalis?

A. It consists in a stricture of the ductus ad nasum, by which the tears are prevented from passing into the nose, and being retained in the lachrymal sac. distend it, and produce an inflammation and suppuration of its cavity. The sac finally bursts, and a fistulous opening forms, through which the tears are discharged, and flow over the cheek.

Q. What are the symptoms of the formation of a cancer?

A. We are to suspect the formation of this disease whenever a glandular part becomes enlarged in size, and knotty, hard, and slightly sensible to the touch, and attended at a later period with sharp lancinating pains. The swelling proceeding, becomes at length surrounded by superficial varicose veins; the integuments become discoloured and puckered; gradually the whole surface of the tumor assumes a purple shining appearance, which it retains, in general, until ulceration takes place.

Q. How are dislocations of the thigh to be reduced?

A. The patient being placed upon his back, counter-extension is made by a band passed between the thighs, so as to make pressure upon the tuber ischii of the side on which the luxation is seated; the ends of this band are to be firmly secured opposite the patient's shoulder, to a staple, or by assistants. Extension is to be made by a strong band being attached by means of a roller to the leg, just above the knee, which band is to be acted upon by a pulley, or a proper number of assistants. In order to draw out the head of the bone from its present situation, and lift it to a level with the brim of the acetabulum, a bandage should be passed round the upper part of the dislocated thigh, and given to an assistant or assistants, while the pelvis is to be fixed by a strap passed around it, and secured opposite to the patient's sound side. These means are to be aided by bleeding, &c. in every case that will admit of it.

Q. How are transverse fractures of the patella to be treated?

A. The patient's leg is to be kept extended upon the thigh by means of a straight splint placed under the limb, long enough to extend from the heel to the but-

tock, and secured on by a roller surrounding the whole limb, from the ancle to the upper part of the thigh; when the bandage has arrived at the knee, the surgeon is to place the fragments of the fractured patella in contact, and, after applying a compress above and below them, is to pass the bandage obliquely around the upper and lower edges of the patella, and under the knee, in the form of a figure 8. To assist in keeping the fragments in contact, it has been proposed by Dr. Dorsey to nail on the splint, near its middle, and at the distance of six inches from each other, two bands of muslin, about one yard long; the lower one of these is to be passed around the upper fragment of the patella, and the upper around the lower fragment, and secured by knots.

Q. How is the operation for fistula lachrymalis to be performed?

A. The abscess in the sac is to be opened by a sharp lancet, and its contents evacuated; a silver probe is now to be passed, if possible, through the ductus ad nasum into the nose, and afterwards a conical piece of bougie, or a proper style, is to be passed into it, and worn for some time: a superficial dressing being applied to the sore. If, however, the ductus ad nasum be completely obliterated, we are to make a new opening into the nose, by perforating with a circular punch, that part of the os unguis which is immediately behind the lachrymal sac; a piece of horn being passed up the nose to receive the end of the punch. The edges of the wound in the skin are to be dressed with adhesive plaster, so that it may heal as soon as possible.

Q. What are the appearances of a cancerous ulcer?

A. A cancerous ulcer is irregular in its figure, and unequal on its surface; the edges of the ulcer are hard, elevated, irregular, and extremely painful; the surrounding skin has a livid aspect; large excavations exist in the bottom of the ulcer, partly produced by the ulcerative process, and partly by sloughing. If the ulceration be extensive, it will be observed that while one portion is undergoing a sloughy process, another will be throwing up luxuriant granulations of a loose spongy texture. These changes appear in some cases to alternate with each other; and in their further progress oc-

casion considerable hæmorrhages, by destroying the coats of the vessels of the part. The discharge from a cancerous ulcer is a very fetid matter, of a serous nature.

Q. What is meant by unguis or pterygium?

A. It is an affection of the external covering of the eye-ball, consisting in an opaque red membrane proceeding from the inner canthus of the eye, of a triangular figure, and caused by an enlargement of the vessels of the conjunctiva.

Q. How is it to be treated?

A. It is to be taken hold of by forceps, and dissected completely off by a pair of curved scissors.

Q. What is the treatment proper for a mammary abscess?

A. When the breast is attacked with inflammation, we should endeavour to prevent suppuration from ensuing by bleeding, both general and local; by purging; by blisters to the part, and by confining the patient to an antiphlogistic regimen. When suppuration has come on, and an abscess forms, it is to be opened with a lancet, and the matter perfectly evacuated. A soft bread and milk poultice will now be the proper application.

Q. How is extirpation of the breast performed?

A. The patient being seated, the arm of the affected side is to be elevated, and held off from the body by an assistant, in order to render the skin tense. If the integuments of the breast be sound, a straight incision should be made through the skin and cellular membrane, and the tumor quickly dissected out. If any part of the integuments are to be removed with the breast, two incisions are to be made, so as to include the diseased skin; and the breast is to be dissected out as before. The bleeding vessels being secured with ligatures, the edges of the wound are to be drawn in contact, and dressed with adhesive strips.

Q. What are the symptoms of a stone in the bladder?

A. There is a dull uneasy sensation at the neck of the bladder, with an itching at the perineum and glans penis. Difficulty is experienced in voiding the urine; the stream is frequently stopped by the stone falling over the orifice of the urethra, and when the bladder is nearly

emptied, great pain is experienced by the bladder contracting on the stone. The urine is sometimes loaded with mucus, at others limpid; it is sometimes tinged with blood, especially after a violent jolt of the body. A tenesmus sometimes attends. All these symptoms are increased by exercise, and a violent exacerbation of all of them will frequently come on without any evident cause, constituting what is called a fit of the stone.

Q. What is the only certain criterion of the existence of a stone in the bladder?

A. Actually feeling it there with a sound.

Q. How is a fistula in ano to be treated?

A. It is to be treated by laying open the sinus by cutting through its side, so that the fistula and the rectum shall form one cavity, with a free external opening. The edges of the incision are to be prevented from uniting, by introducing between them a dossil of lint.

Q. What are the muscles divided in the operation for lithotomy in the male?

A. The transversalis perinæi, a part of the accelerator urinæ, and sometimes a portion of the levator ani.

Q. How is the operation for the relief of strangulated femoral hernia to be performed?

A. The patient being laid upon his back on a proper table, with his head and shoulders a little elevated, his legs as high as his knees hanging over the edge of the table, and his thighs somewhat bent upon the pelvis; the parts having been previously shaved, and the bladder emptied, an incision is to be made through the skin and cellular membrane, commencing an inch and a half above the crural arch, directly over the centre of the tumor, and extending downwards to its middle, below the arch. This incision is to be crossed by another, beginning at the inner side of the middle of the tumor, and extending across to the outer side of it; the two incisions taken together being somewhat of the form of the letter T reversed. If the external pudic artery be opened, it is to be immediately secured by a ligature. This first incision exposes the superficial fascia, which being divided, the tumor becomes so far exposed, that the circumscribed form of the hernia may be distinguished. The sac is, however, still covered by the fascia propria,

which is next to be divided longitudinally from the neck to the fundus of the sac. The hernial sac being now exposed, is to be next opened; to do this, we are to pinch up a small part of it between the finger and thumb, to move it on the finger by which the intestine is felt, and may be separated from the inner side of the sac; and then to cut into the sac, placing the blade of the knife horizontally; into this opening a director is to be introduced, and the sac opened from its fundus to the crural sheath. We are next to divide the stricture; for this purpose the finger is to be pushed gently into the sac; a probe-pointed bistoury is then to be passed into the crural sheath, at the anterior part of the sac, and the sheath is to be cut as far as the anterior edge of Poupart's ligament. If, after this division, the intestines will not readily pass into the abdomen, the finger must be passed half an inch higher, and then the posterior edge of the crural arch, with the fascia that covers it, will be felt strongly compressing the mouth of the hernial sac; to divide this the knife must be carried within the stricture, and then inclined obliquely inwards and upwards, at right angles with the crural arch, and a cut is to be made in that direction sufficient to liberate the intestines from the stricture. The parts are now to be returned, if free from mortification, and the external wound is to be dressed.

Q. What are the cautions to be attended to in performing the operation of lithotomy?

A. 1st, To keep the handle of the staff as nearly as possible at a right angle with the body; 2d, to keep the gorget nearly at a right angle with the staff; 3d, in order to avoid wounding the internal pudic artery, to push the staff as far as possible to the right side; and, 4th, never to push on the gorget while the patient is straining or bearing down: by not attending to this caution we are in danger of wounding the intestines and fundus of the bladder, by these being pushed down against the gorget in the act of straining.

Q. How are false aneurisms to be treated?

A. A free incision is to be made into the cavity of the sac in order to expose the bleeding orifice, &c.; a ligature is then to be applied on the vessel above and below it.

Q. Describe the operation for popliteal aneurism.

A. The patient being laid upon his back, with a tourniquet loosely applied on the upper part of the limb, an incision, about four inches in length, is to be made obliquely over the inner edge of the sartorious muscle, and at about the middle of the thigh. Having cut down to the muscle, and exposed the sheath of the vessels, this is to be cut into, and the artery laid bare. A strong double ligature is to be passed round the artery by means of a blunt needle; the ligatures being divided from each other, they are to be firmly tied on the vessel at about an inch from each other, and the artery is to be divided between them. The edges of the wound are now to be drawn together, and secured by adhesive strips, the ligatures being left out at the angles. The patient is now to be put to bed with the tourniquet loosely on the limb.

Q. What are the symptoms of the hip disease?

A. The accession of this disease is very insidious, being sometimes unpreceded by any particular symptoms that would excite the attention of either the patient or the surgeon. In general, however, there is a weakness of the limb, a loss of appetite, and a disinclination to motion. There is now no pain in the part, though a pain is generally felt in the knee; but at a later period of the disease, pain is experienced in the vicinity of the hip joint, and the limb of the affected side appears longer than its fellow, occasioned by the patient supporting his body entirely on the sound limb, and tilting his pelvis towards the diseased side; pain is caused by examining the joint and by moving the thigh, and the buttock and hip lose their natural convexity. These symptoms continue until suppuration takes place.

Q. How is amputation at the shoulder joint performed?

A. Dr. Physick directs the operation to be performed in the following manner: the patient being seated, and his arm elevated by an assistant, an incision is to be made through the skin and cellular membrane, to extend around the arm, being even with the body on the lower part of the arm in the axilla, and two and a half to three and a half inches below the acromion scapulæ

in front. The flap formed by this incision being dissected up, the muscles in front of the arm are to be divided even with the acromion from the internal to the external fold of the arm-pit; these folds are next to be divided. Pressure is now to be made, by an assistant standing behind the patient, on the subclavian artery, as it passes over the first rib; the joint of the shoulder is then to be cut into, and the arm dislocated. It now only remains to divide the small portion of flesh containing the vessels, &c. which is next to be done; and the vessels being secured as quickly as possible, the wound is to be cleansed, the flap drawn down over it, and the whole properly dressed.

Q. How is the disease in the hip joint to be distinguished from an affection of the knee; the early stage of the former being attended with a pain in the knee joint, apparently without any symptoms of disease at the hip?

A. In the hip disease, pressure in the vicinity of the acetabulum produces pain, as likewise does any motion at the hip, while the knee may be handled and moved freely without any pain whatever being induced.

Q. What muscles are divided in amputating the thigh?

A. The biceps flexor cruris, semitendinosus, semimembrinosus, gracilis, sartorius, vastus externus and internus, rectus femoris, cruræus, and the long tendon of the adductor magnus.

Q. In a case of caries, what would induce you to suppose the portion of bone to be loose?

A. When pressure on it with a probe occasions pain and a discharge of blood; these symptoms being induced by the loosened bone being pressed upon the tender granulations beneath.

Q. What symptoms indicate the formation of an abscess in the hip joint?

A. The pain is augmented and becomes fixed; the parts surrounding the joint become tense, hot, red, and painful; fever comes on attended with occasional rigors; when pus has actually formed, all these symptoms abate, and a fluctuating tumor is perceived at the joint.

Q. How is the hip disease to be treated?

A. During the inflammatory stage the patient is to

be confined to a state of perfect rest, and put on a low diet; leeches are to be applied to the part, and afterwards a blister; the patient is at the same time to be purged actively by jalap and cream of tartar administered every two or three days. This practice of purging was introduced by Dr. Physick, who directs it to be kept up for a considerable time. After suppuration has come on, the treatment is to be directed according to the existing symptoms.

Q. How is amputation of the thigh performed?

A. Having placed the patient in a proper position, with a tourniquet applied on the upper part of the limb, an assistant with both his hands grasps the thigh, and draws up the integuments so as to render them tense, while another holds the foot; an incision is now to be made through the skin and cellular membrane, and extending completely round the limb; a flap, composed of the skin and adipose membrane is now to be dissected up with a scalpel, and turned back; the muscles are next to be divided down to the bone, even with the doubled edge of the reverted flap; a retractor or split piece of muslin is now to be put on, and held by an assistant so as to secure the muscles from injury by the teeth of the saw, and the bone is next to be sawed through. The principal vessels being first secured, the tourniquet should be loosened, and the surface of the stump washed with warm water; any considerable vessel which is now found to bleed must be secured. In dressing the limb, the flap being brought over the stump, a piece of lint is to be interposed between its edges, to allow any pus that may form beneath the flap to escape; adhesive strips are next to be applied over the lips of the flap; afterwards a piece of lint spread with cerate, and over all a pledget of tow. These are to be secured on by a roller passed several times around the thigh, crossed in opposite directions over the stump, and then passed once or twice round the loins to prevent its slipping. The patient is now to be laid on a mattress, with the stump on a pillow, and secured from the pressure of the bed-clothes by a cradle.

Q. How are setons introduced?

A. A seton needle, armed with a skein of silk or

thread oiled, is to be passed through a fold of the skin, the needle being removed, the silk or thread is to be allowed to remain.

Q. Describe the mode of amputating the leg.

A. The patient being placed in a proper position, a tourniquet is be applied on the thigh; the leg and thigh being now secured by assistants, an incision is to be made through the skin and cellular membrane, about five inches below the knee in front, but to descend several inches lower down behind, so as to save there a sufficient portion of the integuments to cover the stump. The flap being dissected loose is to be turned back, and the muscles divided even with the doubled edge down to the bone; a catline is now to be introduced between the bones of the leg, so as to divide the interosseous ligament, &c. A retractor having three slips is next to be applied, one of the slips passing between the bones; this being held by an assistant, so as to defend the muscles, the bones are to be divided with the saw; any spicula remaining being removed with the bone-nippers, the arteries are to be secured by ligatures, and the stump dressed as after amputation of the thigh.

Q. Why is the tourniquet placed above the elbow and knee, in operations on the fore arm and leg?

A. Because there being but one cylindrical bone in those situations, the tourniquet is enabled to press equally on all the vessels of the limb.

Q. In what manner are the fingers and toes amputated?

A. The skin being drawn back, an incision is to be made through it, extending round the finger or toe, a little beyond the joint; a flap large enough to cover the stump is next to be separated with a scalpel and turned back; the remaining parts are then to be divided down to the joint, which being bent, the capsular ligament is to be cut through posteriorly, and afterwards one of the lateral ligaments; the joint can now be dislocated, and the knife passed between the bones to separate the remaining ligaments, &c.; the flap is now to be drawn over the stump, and secured by adhesive plaster, and a narrow roller passed around the finger.

CHEMISTRY.

SECTION III.

Examinations in Chemistry, &c.

Question. By what methods do chemists investigate the properties of bodies?

Answer. By analysis and synthesis.

Q. What do you understand by these terms?

A. By analysis, I understand the reduction of a compound body to its simple elements; by synthesis, the recombination of these elements, so as again to form the substance we had decomposed in the first instance.

Q. What do you mean by specific gravity?

A. I mean the comparative densities of bodies.

Q. By what means do we ascertain the specific gravity of bodies heavier than water?

A. The weight of the substance in the air being known, weigh it immersed in pure water, it will now be found to have lost weight; divide, by this difference of weight, its original weight in air, and the quotient will be its specific gravity; or, in other words, will show how many times heavier it is than an equal bulk of water, which is always taken as the standard.

Q. What are the outlines of the atomic theory?

A. It is taken for granted, that all chemical combinations take place only between the atoms of bodies. When there is but one compound of any two simple bodies, these are supposed to be united atom to atom singly; which combinations have been termed *binary;* but, when there are several compounds of the same elements, they are presumed to combine in proportions expressed by a

number which is a simple multiple of the number of atoms. These combinations are termed *ternary*, when the quantity of one of the elements is double that of the other; *quaternary*, when the proportion of one of the ingredients is tripled, &c.

Q. What do modern chemists understand by the term *atom?*

A. The smallest particles into which any body can be divided without decomposition.

Q. What is meant by a *simple* and a *compound atom?*

A. By simple atoms are meant the particles of any body which has not as yet been decomposed; they are also termed *elementary* atoms. Compound atoms mean the particles of a compound, or decomposable body. The atoms constituting a compound atom are called *component* atoms.

Q. What are we to understand by the affinity or attraction of aggregation?

A. A union of particles of a similar nature, the mass not differing from the original particles in any thing excepting bulk, and perhaps form.

Q. What is meant by single elective affinity?

A. Where a compound of two principles is decomposed by the addition of a third, one new compound being produced.

Q. What do you understand by contiguous affinity?

A. That affinity which takes place between the atoms or particles of a body, and which is effective only at insensible distances.

Q. What is meant by double elective or complex affinity?

A. Where two compounds, consisting each of two principles, reciprocally decompose each other, and a change of principles takes place, forming two new compounds.

Q. What is meant by cohesion?

A. That force, or power, by which the particles or atoms of matter of the same kind attract each other.

Q. By what means may the cohesion of bodies be overcome?

A. 1st, By mechanical operations, such as rasping,

grinding, pulverising, &c.; 2dly, by heat; 3dly, by solution; and, 4thly, by subsequent precipitation.

Q. What do you mean by the term solution?

A. The disappearance of a solid in a fluid, the fluid still preserving its transparency.

Q. What is meant by the affinity of composition, or chemical affinity?

A. The union of particles of a different nature, the new compound possessing different properties from the original particles.

Q. Has the affinity of aggregation any effect upon the affinity of composition?

A. Yes; the latter is always in inverse ratio to the former.

Q. Give an instance where, in the same body, we have an example of both chemical affinity and the affinity of aggregation?

A. This is the case in all compound bodies; thus, in the metal brass, the component atoms, those of copper and zinc, are united by chemical affinity; the compound atoms, those of the brass itself, by aggregation or cohesion.

Q. Into how many rays is light divided by the spectrum?

A. Into seven; viz. red, orange, yellow, green, blue, indigo, and violet.

Q. When the ball of the thermometer is removed entirely out of the confines of the red ray, but still in the line of the spectrum, what takes place?

A. The mercury is found to rise several degrees.

Q. Is the same effect produced beyond the violet ray?

A. No; but the invisible rays at this end of the spectrum are found to have the power of blackening the muriates of mercury.

Q. In addition to a change of chemical properties, what sensible changes are produced in bodies in consequence of chemical action?

A. 1st, A change in their *specific gravity*, which, most generally, is greater than the mean gravity of the bodies entering into composition, but in some instances it is less; 2dly, a change of temperature; 3dly, a change of

form, either from a solid to a fluid, or vice versa; and, 4thly, a change of colour.

Q. What is meant by caloric?

A. Caloric is a term made use of by modern chemists to distinguish the cause or matter of heat, from the sensation which this cause or matter produces.

Q. How is the specific gravity of a body lighter than water ascertained?

A. After ascertaining its weight in air, attach to it a body of greater density, whose weight in water is known, and weigh them immersed together, the additional substance will now be found to weigh less than it did when unattached; add this difference of weight to the weight in air of the lighter body, and the amount will be the weight of a quantity of water equal in bulk with the latter; this being compared with the absolute weight of the body under examination, will give its specific gravity.

Q. Does the same quantity of caloric exist in ice as in water at 32°?

A. No; the latter contains 140° more than the former, which, however, exists in a latent state.

Q. Can this be proven by experiment?

A. Yes; 1st, add to water at 172°, an equal quantity of ice at 32°; when the ice has melted, the temperature of the whole will be only 32°, hence, 140° were expended in rendering the ice fluid; or, 2d, expose, in an equal degree of heat, equal quantities of water and of ice, both at 32°, the water will become heated to 172°, while the ice has merely been melted without acquiring any increase of temperature.

Q. Do equal weights of different bodies, at the same temperature, contain equal quantities of caloric?

A. No; every different body requires a different quantity of caloric to raise it to the same degree of sensible heat, as ascertained by the thermometer; hence we say, the capacity for heat is different in different bodies.

Q. What is meant by a substance being precipitated?

A. When a fluid, holding one or more substances in solution, lets one fall on the addition of some new body to which the combination has a greater affinity, the

one let fall is said to be precipitated by the newly added substance.

Q. A heated body being exposed to the open air, in what manner does it lose that portion of caloric which raises its temperature above that of the surrounding atmosphere?

A. To the air in immediate contact with the body is communicated a portion of the caloric, and being in consequence dilated, it becomes specifically lighter and ascends; and its place is supplied by a colder and heavier portion of air from above, which, in its turn, becomes heated, ascends and is again supplied by another portion; a portion of the caloric is also given off by radiation.

Q. What is meant by the radiation of caloric?

A. That process by which caloric passes off in every direction from a heated body, with great velocity, apparently in parallel rays, independent of the agency of the surrounding atmosphere.

Q. How is nitrogen gas procured?

A. By heating together in a retort, recent animal flesh and nitric acid; or by robbing the atmosphere of its oxygen, by means of a sulphuret of potash or of iron moistened.

Q. What are the properties of nitrogen gas?

A. It is an elastic, invisible fluid, incapable of supporting respiration, combustion, or vegetation; it is insoluble in water, and lighter than common air in the proportion of 985 to 1000.

Q. What are the different compounds of nitrogen and oxygen?

A. Atmospheric air, nitrous oxyde, nitric oxyde or nitrous gas, and the nitric acid.

Q. Has the nature of the surface of a body any influence upon its power of radiating caloric?

A. A very powerful one: the rougher the surface, and the darker the colour, the more rapidly will the caloric be radiated.

Q. What do you understand by the term crystallization?

A. That process by which the particles of salts, &c. arrange themselves in a regular and determinate form.

Q. What law, with respect to crystallization, has the abbe Haüy experimentally demonstrated?

A. That in every crystallized substance, whatever may be the difference of figure impressed upon it by modifying circumstances, there is, in all its crystals, a primitive form, the nucleus, as it were, of the crystals, invariable in each substance, and by various modifications, which he points out, giving rise to the numerous secondary or actual existing forms.

Q. What do you mean by the water of crystallization?

A. It is that portion of water which combines with salts in the act of crystallization, and becomes a component part of the crystallized salt.

Q. What is meant by the terms efflorescent and deliquescent crystals?

A. By an efflorescent crystal is meant one, which, on exposure to the atmosphere, loses its water of crystallization, and falls into a dry powder; and by a deliquescent crystal, one which attracts moisture from the air and becomes fluid.

Q. What do you mean by a simple element?

A. A substance which, in the present state of chemistry, is incapable of being decomposed.

Q. How many kinds of aggregative or sensible attraction are there?

A. The attraction of gravitation, the attraction of electricity, and the attraction of magnetism.

Q. How is oxygen gas procured?

A. It may be procured, 1st, by heat, from the red precipitate per se, and the other oxydes of mercury, or from the oxydes of lead; 2d, by the action of the sulphuric acid upon the black oxyde of manganese; 3d, from the oxymuriate of potash; 4th, by the decomposition of water by the agency of galvanism; or, 5th, and which is the best mode when any quantity is to be obtained, by exposing nitrate of potash to heat; the gas in this case becomes, towards the close of the process, considerably contaminated with nitrous gas, if we are not careful to stop the process the moment this gas begins to come over.

Q. What are the properties of oxygen gas?

A. It is a colourless, elastic fluid, somewhat heavier than atmospheric air; it is essential to the support of animal life, of combustion, and of vegetation, and has been considered as the acidifying principle, from whence it has derived its name, which signifies, to produce acidity.

Q. What is meant by an oxyde?

A. A substance produced by the union of oxygen with a combustible basis, but not in a sufficient quantity to produce acidity.

Q. Is a fluid capable of dissolving substances to an indefinite extent?

A. No; but only to a certain degree: when it will dissolve no more, it is said to be saturated.

Q. When a menstruum has been saturated with one substance, is it incapable of dissolving another?

A. No; thus water, when saturated with common salt, is capable of dissolving sugar, &c.

Q. When a number of bodies, of different degrees of temperature, are placed in contact, what takes place?

A. They will acquire a common temperature.

Q. How many sources of heat are there?

A. Five; the sun, combustion, mixture, friction, and percussion.

Q. How is hydrogen gas procured?

A. By pouring diluted sulphuric acid upon iron filings, or upon zinc, and collecting the gas over water.

Q. What is the rationale of this process?

A. The iron or zinc, when in contact with water, in conjunction with sulphuric acid, has a greater affinity for oxygen than hydrogen has: the oxygen of the water, therefore, unites to it, forming an oxyde of the metal, which is immediately dissolved by the acid, while the hydrogen of the water is set free.

Q. What are the properties of hydrogen gas?

A. It is a highly inflammable, invisible fluid; when mixed with oxygen or atmospheric air, it detonates on the application of a burning body; it extinguishes flame, and is hurtful to animal life, and is the lightest substance with which we are acquainted.

Q. What are the compounds of hydrogen?

A. With oxygen it forms water, with nitrogen ammonia, and with chlorine, muriatic acid.

Q. What are the leading properties of the alkalies?

A. They have an acrid taste; change vegetable blues to a green; are readily soluble in water, and form with the acids neutral salts.

Q. How many alkalies are there?

A. Three; potass, soda, and ammonia.

Q. What are the properties of the fixed alkalies?

A. In addition to the general properties of the alkalies, they attract moisture very rapidly from the atmosphere, and become deliquesent; they are not volatilized by a moderate heat, and when melted with silex they form glass.

Q. Are the alkalies simple substances?

A. No: they would appear to be peculiar metals united to oxygen.

Q. How may the decomposition of alkalies be effected, and their metallic bases obtained?

A. Either by the agency of galvanism, or heating them in contact with iron filings in a gun-barrel; the iron attracts the oxygen of the alkali, and leaves the metal in a pure state.

Q. What are the leading characteristies of the metallic bases of potass and soda?

A. Potassium, or the base of potass, at the temperature of 60° Fahrenheit, exists in small opaque globules, having a metallic lustre, and the general appearance of globules of mercury. Its specific gravity, in eomparison with water, is about as 6 to 10; at the temperature of the atmosphere it absorbs oxygen slowly, but if heated nearly to redness it burns with a brilliant flame, and intense heat; when thrown upon water or upon ice exposed to the atmosphere, it deeomposes the water with great violence, and an intense flame, a solution of pure potass being the result. If atmospheric air be excluded there is much heat and noise, but no flame. Potassium readily combines with the simple combustibles, and produces, with mercury, a soft malleable alloy. It unites also with gold, silver, and eopper. When heated in contact with the metallic oxydes, it readily decomposes them. Sodium, at commmon temperatures, exists in a

solid form, and agrees in many of its properties with potassium; it is, however, much less fusible.

Q. Of what is water composed?

A. Of about 85 parts oxygen and 15 of hydrogen.

Q. How is this proved to be the composition of water?

A. By analysis and synthesis; pass water in the state of steam over red hot iron filings contained in a gun-barrel, the oxygen of the water will be absorbed by the iron, converting it into an oxyde, and the hydrogen will be liberated, and may be collected over water; or, 2d, by firing together, in a close vessel, proper proportions of oxygen and hydrogen, water will be produced.

Q. What are the properties of acids?

A. They have a sour taste, change vegetable blues to a red, and by their union with alkalies, earths, and metallic oxydes, form salts.

Q. How is sulphuric acid procured?

A. By burning, in close leaden chambers, sulphur combined with a small quantity of nitre; the vapours produced are absorbed by a quantity of water placed in the bottom of the chamber, and the acid is afterwards reduced to its proper strength by distillation in a retort.

Q. What is the product formed by the union of oxygen with a combustible basis?

A. Either an oxyde, an acid, or an alkali.

Q. What is the composition of atmospheric air?

A. Twenty-one per cent. of oxygen to seventy-nine of azote, by measure.

Q. How would you procure ammoniacal gas?

A. By adding together equal quantities of muriate of ammonia and quick lime, and exposing them to a gentle heat; a decomposition takes place, the lime seizes upon the muriatic acid, forming muriate of lime, while the ammoniacal gas is given off, and may be collected over mercury.

Q. What are the properties of sulphuric acid?

A. It is a very ponderous, corrosive fluid, destitute of either colour or smell, and has a strong acid taste; when poured from one vessel into another, it runs in striæ like oil. It has a great affinity for water, on combining with which, a considerable degree of heat is evolved. Sul-

phuric acid unites with the earths, alkalies, and metallic oxydes, forming with them salts, denominated sulphates.

Q. What are the properties of ammonia?

A. Besides all the propertics of the other alkalies, it possesses great volatility, and a very pungent smell; it immediately extinguishes a lighted candle, and is fatal to animal life; when pure, it exists in the state of gas, which is rapidly absorbed by water, constituting liquid ammonia.

Q. Is ammonia a simple substance?

A. No; it is a compound of nitrogen and hydrogen.

Q. How do you procure muriatic acid?

A. Add together muriate of soda and sulphuric acid, and expose them to heat in a retort, the sulphuric acid will decompose the muriate of soda, and, uniting with the alkali, form sulphate of soda, while the acid passes over in a gaseous state.

Q. What are the characteristics of the sulphates?

A. They are insoluble in alcohol; their solutions are decomposed by a solution of barytes; they become converted into sulphurets by ignited charcoal at high temperatures, but are undecomposable by heat alone.

Q. How is the oxymuriatic acid procured?

A. By adding together, in a retort, muriate of soda, black oxyde of manganese, and sulphuric acid, and exposing to a gentle heat.

Q. What is Mr. Davy's opinion with respect to the muriatic and oxymuriatic acids?

A. He supposed the oxymuriatic acid to be a simple substance, which he calls chlorine, and which, in union with hydrogen, he supposes to form muriatic acid.

Q. Does chlorine unite with the simple gases?

A. Yes; it unites with oxygen, forming *euchlorine*, with nitrogen and with hydrogen, forming muriatic acid, &c., the two first of these compounds have the property of exploding when exposed to a gentle heat.

Q. What do you mean by latent heat?

A. That portion of heat which is required to maintain the fluid or vaporous state of a body, but which does not affect the thermometer.

Q. What is the meaning of the term specific heat?

A. By specific heat is meant that quantity of heat which any particular body requires to raise it to any given degree of temperature as indicated by the thermometer, and which differs in every different body.

Q. What is sulphur?

A. It is a brittle, inflammable substance, found principally in the mineral kingdom; it is of a yellow colour, of a suffocating smell when heated, and becomes electric upon being rubbed.

Q. What are its principal compounds?

A. Sulphurous and sulphuric acids; sulphurated hydrogen and the different sulphurets of the metals, earths, and alkalies.

Q. What do you mean by an earth?

A. An inodorous, uninflammable, brittle substance, very sparingly soluble in water, and when pure of a white colour; its specific gravity does not exceed 5.

Q. Are earths simple substances?

A. No; they are in all probability metallic oxydes.

Q. What are the leading properties of barytes?

A. It is a very ponderous earth, of a highly caustic taste; it changes vegetable blues green; it is poisonous, and when pure readily absorbs water.

Q. What are the leading properties of strontites?

A. They differ but little from those of barytes; the chrystals of strontites, however, differ from those of barytes in form, and in being less soluble in water, and give out, when burnt with alcohol, a blood-red flame, whereas those of barytes give a yellowish flame.

Q. What is the test of the muriatic acid?

A. The nitrate of silver, which produces with it a white precipitate, the muriate of silver.

Q. What is the test of sulphuric acid?

A. The muriate of barytes, producing with it a white precipitate, which is the sulphate of barytes.

Q. What effect has oxymuriatic acid upon vegetable colours?

A. It destroys them, and hence its great value in the process of bleaching.

Q. In the formation of an acid, does the oxygen enter in combination with the basis in one proportion only?

A. No; in most cases it enters in combination with

the basis in two proportions, forming acids of different degrees of strength.

Q. How is this difference distinguished in chemical nomenclature?

A. The name of the acid with the lowest proportion of oxygen terminates in *ous*, that with the highest proportion, in *ic*.

Q. What do you mean by a salt?

A. It is a substance formed by the union of an acid with an alkali, an earth, or a metal, and is characterized by its sapidity, ready solubility in water, incombustibility, and its capability of assuming a regular form, or of crystallizing.

Q. What are the properties of muriatic acid?

A. Muriatic acid, in a gaseous state, is invisible like air; has a pungent, suffocating smell, and is indecomposable by art. With water it forms liquid muriatic acid, which preserves the smell of the gas, and gives out a vapour, which fumes when exposed to the air. It disengages the carbonic, phosphoric, and sulphurous acids from all their combinations, but is itself expelled by the sulphuric; with various bases, it forms salts called muriates.

Q. How are pure potass and soda obtained?

A. Pure potass is obtained by lixiviation from the ashes of land vegetables; pure lime is added to extract the carbonic acid, and the liquor being evaporated nearly to dryness, is digested in alcohol, which dissolves nothing but the pure alkali; the alcohol is again to be separated by distillation. Soda is obtained by the same process, but only from plants growing close on the sea shore, &c.

Q. What is the reason that when I apply my hand to iron and to wood at the same temperature, the former feels so much colder than the latter?

A. Because the iron is a much better conductor of caloric than the wood, and consequently more rapidly robs the hand of its heat.

Q. What is meant by a gas?

A. It is a permanently elastic, æriform fluid, transparent, elastic, ponderable, invisible, and not condensible into a solid or fluid state by any degree of cold hitherto known.

Q. In what substance are we presented with a specimen of pure carbon?

A. In the diamond.

Q. What is charcoal?

A. It is an oxyde of carbon.

Q. What effect has charcoal upon the putrefactive fermentation?

A. It retards or suspends it.

Q. What peculiar property has charcoal with respect to the gases when immersed in them?

A. It absorbs them unchanged.

Q. What are the properties of oxymuriatic acid?

A. When in the form of gas, it possesses a peculiar pungent and suffocating odour; it is perfectly irrespirable, but will in many cases support combustion; absorbed by water it forms liquid oxymuriatic acid: this acid discharges vegetable colours, oxydizes all the metals, and is the only acid capable of dissolving gold and platina. With various bases it forms salts called hyperoxygenized muriates.

Q. How is the combination of a combustible with a metal, an earth, or an alkali, designated?

A. By the name of the combustible terminating in *uret;* thus the combination of carbon with iron is called a carb*uret* of iron, and of sulphur with lime, a sulph*uret* of lime.

Q. How are the salts, formed by an acid of the highest grade of oxydation, distinguished from those formed by an acid in the lower grade of oxydation?

A. The former terminate in *ate*, the latter in *ite;* thus, the salt formed by the union of sulphur*ic* acid with lime, is called sulph*ate* of lime, while that formed by the sulphur*ous* acid is denominated the sulph*ite* of lime.

Q. What are the properties of the muriates?

A. When acted upon by the sulphuric acid, they yield a white vapour, which is muriatic acid, and when by the nitric, oxygenated muriatic acid gas, with considerable effervescence; they are decomposed by a solution of the nitrate of silver, and are volatilized at high temperatures without decomposition.

Q. How would you distinguish the sulphate of soda from the sulphate of magnesia?

A. I would add a solution of potass to a solution of each of the salts; with the sulphate of magnesia there would be white precipitate, with the sulphate of soda none.

Q. What is alum, chemically speaking?

A. It is a sulphate of alumine and potass.

Q. How is the nitric acid procured?

A. By adding together, in a retort, nitrate of potass and sulphuric acid; the nitric acid, on the application of heat, passes over into the receiver, and a sulphate of potass remains behind.

Q. What are the properties of nitric acid?

A. It is a fluid, clear and colourless like water; its smell acrid; its taste exceedingly acid; and its action on animal substances very corrosive; it has the property of permanently staining the skin yellow; it has a great affinity for water; is capable of oxydizing most of the metals, and with various bases forms salts named *nitrates.*

Q. What is phosphorus?

A. It is a highly inflammable substance, of a yellowish colour, transparent, and of the consistency of wax; it is luminous in the dark at common temperatures, and is soluble in oils.

Q. What are the principal compounds of phosphorus?

A. With oxygen, constituting the phosphorous and phosphoric acids; with hydrogen, forming phosphuretted hydrogen; and with the metals, earths, and alkalies, forming phosphurets.

Q. What are the distinguishing characters of the oxymuriates or hyper-oxygenized muriates?

A. They are distinguished by yielding oxygen gas when heated, and thus becoming converted into muriates. They detonate violently by friction and percussion with the easily inflammable bodies.

Q. What are the different compounds of carbon?

A. Carbonic acid gas, carbonic oxyde, and carburetted hydrogen.

Q. What are the leading properties of the sulphurets?

A. They are perfectly devoid of odour when dry, but exhale, when moistened, a smell resembling rotten eggs; they stain the skin black, and change vegetable blues to a green.

Q. What is the first or most obvious effect produced on all bodies by heat?

A. A dilatation, or increase in the bulk of the body.

Q. How may nitrous oxyde be procured?

A. By exposing to heat, in a retort, the nitrate of ammonia.

Q. What is the rationale of this operation?

A. The nitrate of ammonia is composed of nitric acid and ammonia; the nitric acid consists of nitrous gas and oxygen, and the ammonia of nitrogen and hydrogen; at a high temperature a decomposition takes place, when the nitrous gas of the decomposed acid combines with an additional dose of nitrogen, afforded it by the ammonia, and forms the nitrous oxyde, while the oxygen of the acid unites with the hydrogen of the ammonia to form water.

Q. What are the properties of the nitrous oxyde?

A. It is heavier than atmospheric air, possesses a sweet taste, and a slight but agreeable odour; it is not manifestly acid. It is absorbed by water, and when again given out possesses all its former characters; its most remarkable property is its highly exhilarating effects upon the system, when respired.

Q. Are there any exceptions to the general law that all bodies contract on cooling?

A. Yes; water, when cooled nearly to the freezing point, instead of contracting on the further abstraction of caloric, actually expands; fused iron and some other metals also expand on becoming cool.

Q. How is phosphoric acid procured?

A. It may be obtained either, 1st, by the slow combustion of phosphorus; 2d, from calcined bones, which consist of the phosphate of lime, by the aid of the sulphuric acid; or, 3d, by the action of nitric acid upon phosphorus.

Q. What are the properties of lime?

A. When pure, it is perfectly white, brittle, and infusible; it has a hot, caustic taste; corrodes animal and vegetable substances; changes vegetable blues, green; and upon the application of water it heats and falls into powder, absorbing near one-fourth its weight of the water, in which state it is called a hydrate of lime.

Q. What are the distinguishing properties of the nitrates?

A. They yield oxygen and nitrous gases by the action of heat; they give out a yellowish vapour, which is nitrous acid; when acted upon by the sulphuric acid and when mixed with combustible substances, at a red heat, they inflame and detonate.

Q. How is carbonic acid gas to be procured?

A. By the action of sulphuric acid upon the carbonate of lime, or by burning charcoal in oxygen gas.

Q. What are its properties?

A. It is about one-third heavier than atmospheric air; has a penetrating odour and an acid taste; it extinguishes flame, and is destructive of animal life; it is readily absorbed by water, to which it communicates a sparkling appearance and a pungent acid taste.

Q. What are the properties of the phosphates?

A. They are not decomposed on being heated with charcoal, but are in part decomposed by sulphuric acid; they are soluble in the nitric and muriatic acids without effervescence, and may again be precipitated from this solution by lime water or pure ammonia.

Q. What is the test of the presence of lime?

A. The oxalate of potass, which produces with it a white precipitate, the oxalate of lime.

Q. What are the distinguishing properties of the metals?

A. Metals are distinguished by their opacity, the great specific gravity of a majority of them, and their peculiar brilliancy; they are the best conductors of heat and of electricity.

Q. What other properties are possessed by a part of the metals?

A. Ductility, or the capability of being drawn into wire; and malleability, or the property of being beaten into plates or leaves.

Q. If through a portion of lime-water I pass a stream of carbonic acid gas, what will be the effect?

A. The water will become cloudy, occasioned by the precipitation of the lime.

Q. If after all the lime is precipitated, I still continue to add more carbonic acid, what will be the effect?

A. The water will resume its transparency.

Q. How do you explain these different effects?

A. Carbonate of lime, which is formed in the first instance, is insoluble in water, and of course precipitates; but on adding an excess of carbonic acid, as in the latter case, it again becomes soluble.

Q. What do you mean by an alloy?

A. The union of two different metals.

Q. What is iodine?

A. It is a peculiar substance, first discovered in 1812, by a M. Courtois, of Paris. It is solid at the ordinary temperature of the atmosphere. Its colour is bluish black, it is soft and friable, of a metallic lustre, its taste is very acrid, it is sparingly soluble in water, and a non-conductor of electricity. It stains the skin of a yellowish colour, which, however, soon disappears. It is fusible at 250° Fahrenheit, and is volatilized at about 350°. In contact with water at the boiling point, it is converted into a vapour of a beautiful violet colour, and hence its name (from ἰωδης violet.) It combines with oxygen, nitrogen, chlorine, euchlorine, sulphur, phosphorus, the alkalies, and metals.

Q. How is it procured?

A. From the residuum left after all the soda has been separated, by chrystallization, from a solution of kelp or barilla, or from the ley of ashes of marine plants, by adding concentrated sulphuric acid, in a retort;—the iodine passes over into the receiver in the form of violet-coloured vapours, which condense on the sides of the receiver in crystalline plates.

Q. How would you procure sulphuretted hydrogen?

A. By pouring a diluted acid upon an alkaline sulphuret.

Q. What are its properties?

A. It possesses a very fœtid smell; is irrespirable; and burns with oxygen, without explosion, depositing sulphur; it blackens the white metals; is absorbed by water, and renders vegetable blues red.

Q. What are the properties of magnesia?

A. It is very light, of a white colour, insipid, and almost entirely insoluble in water; it slightly changes ve-

getable blues to a green, and forms soluble salts of a bitter taste with most of the acids.

Q. How do you procure phosphuretted hydrogen gas?

A. By adding together, in a retort, pure caustic potass and phosphorus; filling the retort with, and immersing its beak in, warm water, and applying heat.

Q. What is the rationale of this process?

A. At a certain temperature, the alkali decomposes the water, the hydrogen of which unites with one portion of the phosphorus to form phosphuretted hydrogen, while the oxygen of the water unites with another portion of the phosphorus, and forms phosphoric acid.

Q. What are the properties of phosphuretted hydrogen gas?

A. It is the most inflammable substance we are acquainted with, taking fire the moment it is brought in contact with the atmosphere; mixed with oxygen, it burns with great violence.

Q. Do the metals unite with acids?

A. They do in the state of oxydes, but not in their metallic state.

Q. How is carburetted hydrogen gas obtained?

A. By one or other of the following methods: 1st. The vapour of water being brought in contact with charcoal at a red heat, the oxygen of the former combines with a portion of carbon, forming carbonic acid. The hydrogen of the water, at the moment of its liberation, unites with another portion of the charcoal, constituting carburetted hydrogen, from which the carbonic acid may be separated by agitation in lime water. 2d. By agitating the stagnant mud of pools or ditches, bubbles of the gas will ascend to the surface. 3d. By distilling in an iron retort, sea coal or tar, and washing the product in water. 4th. By conducting the steam of ether or alcohol through an ignited porcelain tube, and collecting and washing the product in lime water. 5th. By distilling in a glass retort, with a gentle heat, three parts of concentrated sulphuric acid, and one of alcohol, and collecting the result over water.

Q. What is its most important property?

A. That of burning with a strong, compact, very lu-

minous flame, in consequence of which, it has been applied to the purpose of lighting houses, cities, &c.

Q. When charcoal in fine powder, phosphorus, or the metals, in minute division, are introduced into oxymuriatic acid gas, what is the effect?

A. They become ignited.

Q. What are the properties of silex?

A. It is of a white colour, of a rough and harsh feel, perfectly tasteless and insoluble in water, but soluble by the fixed alkalies; it is incapable of fusion alone. It is not acted on by any acid excepting the fluoric.

Q. What is the most important compound of silex?

A. With potass, forming glass.

Q. How could you distinguish a solution of platina from one of gold?

A. By adding to each a solution of the muriate of ammonia, there would be with the platina a precipitate, but not any with the gold.

Q. If to a metallic solution I were to add a solution of the muriate of tin, and a purple precipitate ensue, what metal would you conclude to be present?

A. Gold.

Q. What is this purple precipitate?

A. It is an oxyde of gold and of tin, known by the name of the purple powder of Cassius.

Q. Does the metallic basis of potass, named by Mr. Davy potassium, unite with mercury?

A. Yes.

Q. What is particularly to be observed of the metals in this combination?

A. The power of the mercury to amalgamate with the other metals is increased, and the avidity of the potassium for oxygen is augmented.

Q. What are the properties of alumine?

A. When pure, it is white, of a smooth, unctuous feel, and it strongly adheres to the tongue; with water it forms a soft tenacious mass, capable of being moulded into different shapes. It contracts greatly by heat, and acquires a flinty hardness. It is soluble by the liquid fixed alkalies. It combines with most of the acids, and forms salts of a sweetish, styptic taste.

Q. To what important purpose has this earth been applied by Mr. Wedgewood?

A. To the admeasurement of high degrees of temperature. This gentleman found the volume of a brick of the clay to contract in proportion to the degree of heat to which it was exposed; this contraction he measures by a scale of a particular construction, each degree of which is equal to 130° of Fahrenheit.

Q. How is the fluoric acid obtained?

A. By the action of sulphuric acid upon powdered fluate of lime.

Q. What are the properties of fluoric acid?

A. It is an invisible, elastic gas, heavier than atmospheric air, possessing a peculiar suffocating odour, resembling that of the muriatic acid. It is rapidly absorbed by water, and has the property of acting upon silex, and consequently corrodes glass.

Q. In how many different ways may a metal be oxydized?

A. Either by exposure to the atmosphere, by heating it in contact with the air, by combustion in oxygen gas, by galvanism, by the decomposition of water, or by transferring to it oxygen from another oxyde.

Q. Is a metal capable of union with only one proportion of oxygen?

A. Most metals are capable of union with two or more proportions of oxygen, forming different oxydes.

Q. How are these different oxydes denominated?

A. If there be but two oxydes of a metal, the one containing the lowest proportion of oxygen is denominated a protoxyde, the other a peroxide. If there be more than two, the second is denominated a deutoxyde, the third a tritoxyde, &c.

Q. How may prussic, or hydrocyanic acid be obtained?

A. By boiling together, in a glass matrass, two parts pulverised prussian blue, one of red oxyde of mercury, and six of water; the boiling is to be continued for half an hour, during which time the matrass is to be frequently shook; afterwards the liquor thus obtained is to be filtered, and then poured into a bottle containing about an ounce of iron filings; three ounces concen-

trated sulphuric acid are now to be added, and the whole shook together for some minutes; after being allowed to settle, it is to be placed in a retort, the receiver of which contains a little distilled water, on a sand bath; on the application of a gentle heat, the prussic acid will pass into the receiver; and when about one-fourth of the liquor has come over, the operation is to be suspended. The prussic acid may also be obtained by supersaturating the prussate of potass with sulphuric acid, and frequently distilling.

Q. What is its composition?

A. Carbon, hydrogen, and nitrogen.

Q. What are its properties?

A. It is a highly volatile, colourless fluid, possessed of a strong odour, resembling that of peach blossoms, or of bitter almonds bruised. It has a sweetish but acrid taste; is highly poisonous, and does not affect the most delicate vegetable blues.

Q. What is cyanogen?

A. It is a binary compound of carbon and nitrogen, forming the basis of the prussic, or hydrocyanic acid.

Q. How is it obtained?

A. By distilling prussate of mercury in a coated glass tube, at nearly a red heat, and collecting the gas over mercury.

Q. What are its properties?

A. It is in the form of a gas, much heavier than atmospheric air. It is absorbed by water, alcohol, by the alkalies and alkaline earths. It burns with a beautiful blue flame, hence its name (from κυανος blue.) It unites with hydrogen, forming hydrocyanic acid.

Q. What is tannin?

A. It is a peculiar principle, obtained from vegetables of an astringent nature, particularly from galls. It is of a yellowish colour, and of a resinous appearance. It has a bitter astringent taste, is soluble in hot water, and in alcohol. A solution of tannin, on being added to a solution of animal gelatine, converts it into a tough, elastic substance, resembling leather. It is by the agency of this principle, that the process of tanning is effected.

Q. What is meant by the chromic acid?

A. Chromic acid is chromium combined with oxygen. It exists in the form of an orange-coloured powder.

Q. By what acids is gold acted upon?

A. By the nitro-muriatic and oxymuriatic only.

Q. Can the gold be precipitated from this solution in a metallic state?

A. Yes: by carbon, by hydrogen, sulphuretted hydrogen, and the green sulphate of iron.

Q. What is gum?

A. It is a vegetable substance, destitute of either taste or smell, soluble in water, insoluble in alcohol, and coagulable by the weaker acids, and metallic solutions; it is convertible into oxalic acid by the nitric, and into citric by the muriatic.

Q. What do you mean by lunar caustic?

A. The fused nitrate of silver.

Q. How is the gallic acid obtained?

A. By evaporating to a dry state a watery solution of galls, dissolving the mass in alcohol, and straining. The alcohol is to be again separated by distillation, and the substance remaining is to be evaporated to dryness, mixed with clean sand, and sublimed.

Q. What are its properties?

A. It has an acid astringent taste, reddens vegetable blues, is inflammable, and precipitates iron of a deep black colour; and hence its use in the formation of writing ink, and the black dyes.

Q. What is the test of silver?

A. The muriatic acid, which produces with it a white precipitate.

Q. How would you distinguish the nitrate from the sulphate of copper?

A. By adding to a solution of both a solution of the acetate of lead, with the nitrate there will be a white precipitate thrown down, but with the sulphate none.

Q. What are the tests of arsenic?

A. The presence of arsenic may be detected, 1st. By adding to a solution of the suspected substance, a solution of the hydro-sulphuret of potass; if any arsenic be present, a precipitate will be instantly thrown down, of a golden yellow colour. 2d. By adding to the solution a drop or two of a weak solution of carbonate

of potass, and afterwards a few drops of a solution of sulphate of copper; the presence of arsenic will be shown by a precipitate of a yellowish green colour, known by the name of Scheele's green. 3d. By mixing the suspected substance with three times its weight of the black flux, and exposing it to a red heat for some time in a glass tube coated with clay; if any arsenic be present, it will now be found in the form of a brilliant metallic coating on the inner surface of the glass. 4th. By placing a small portion of the suspected substance with half its bulk of powdered charcoal, and a drop or two of oil, between two plates of polished copper, which are to be tightly bound together with wire, and exposed to a red heat; the presence of arsenic will cause a permanent white stain on the copper. 5th. By throwing the metallic substance obtained by experiment third on a heated iron; if it be arsenic, a dense bluish smoke will arise, and a strong smell of garlic will be perceived. 6th. Mr. Hume has proposed the following test. Let the fluid suspected to contain arsenic be filtered, then let the end of a glass rod, wetted with a solution of pure ammonia, be brought in contact with the fluid, and at the same time, let the end of another clean rod, similarly wetted with a solution of the nitrate of silver, be immersed in the mixture; if the least portion of arsenic be present, a precipitate of a bright yellow colour, inclining to orange, will appear at the point of contact, and will readily fall to the bottom of the vessel. As this precipitate is soluble in ammonia, care must be taken not to add an excess of that alkali. 7th. By adding chromate of potass to a solution containing arsenic, a greenish precipitate ensues.

Q. How many sulphates of iron are there?

A. There are two; the red and the green sulphates, or in other words, the sulphates of the red and of the black oxyde, or of the protoxyde and peroxyde of iron.

Q. What is the malic acid?

A. It is an acid obtained from the juice of apples, plums, barberries, elder-berries, and gooseberries, and also the common house leek, in which it exists ready formed. It is a very acid, reddish-coloured liquid, and is composed of oxygen, hydrogen, and carbon.

Q. What is blue vitriol?

A. It is a supersulphate of the black oxyde of copper.

Q. What is the test of copper?

A. Ammonia, which produces with it a deep blue precipitate, which is the ammonuret of copper.

Q. What are the ethiops mineral and cinnabar, chemically speaking?

A. They are a black and a red sulphuret of mercury, differing in the proportion of sulphur entering into each.

Q. What is steel?

A. It is a carburet of iron.

Q. What is the sebacic acid?

A. It is an acid produced from hog's lard, by distilling the lard, and adding to the product acetite of lead, a precipitate will be formed, which is the sebate of lead; this being decomposed by the addition of sulphuric acid, a substance resembling fat will appear on the surface; this is to be collected, dissolved in boiling water, and allowed to cool and crystallize, and is the sebacic acid.

Q. What are the tests of iron?

A. Either an infusion of galls, which forms with it a black precipitate, or the prussiate of potass, which precipitates it of a deep blue colour.

Q. What do you mean by a resin?

A. It is a peculiar vegetable principle, insoluble in water, but soluble in alcohol and in oils: it is very inflammable, and yields much soot during combustion; at a heat lower than that of boiling water, it melts into an oily fluid, but becomes again solid on cooling.

Q. How do we procure the citric acid?

A. To any quantity of boiling lemon juice, add, gradually, pure carbonate of lime (prepared chalk) in powder, until the effervescence ceases; separate the white precipitate formed during this process, by straining, and washing it with water, until this fluid passes tasteless through the strainer; add to the washed precipitate, diluted sulphuric acid, and boil the whole for half an hour, frequently stirring; strain and evaporate the fluid thus procured, until it becomes of the consistency of

syrup, and set it by to crystallize. These crystals, which are the citric acid, may be further purified by repeated solution and crystallization.

Q. What is the rationale of this process?

A. The citric acid contained in the lemon juice enters into combination with the lime of the chalk, and forms the insoluble citrate of lime, while the carbonic acid gas escapes; on adding the sulphuric acid, it, from its greater affinity to the lime, unites with it in the form of sulphate of lime, which is precipitated, while the citric acid is left in a free state.

Q. What are the distinguishing properties of albumen and gelatine?

A. *Albumen* is an insipid substance contained in the blood of animals, and constituting the chief part of the white of eggs. On exposure to heat, and by the action of the mineral acids, it is converted into a firm substance, which is insoluble. Albumen, when dried, becomes brittle and semi-transparent, like horn, and is again soluble in water. *Gelatine* is obtained from the tendons, cartilages, ligaments, &c. of animals, by boiling; it is insipid, and destitute of smell; soluble in hot water, but insoluble in alcohol; on being dried it becomes hard, constituting glue. Gelatine is precipitated from its solution by tannin.

Q. How may steel be distinguished from iron by a chemical test?

A. By dropping nitric acid upon a polished plate of iron, a white stain will be left, but on steel a black one.

Q. What is the suberic acid?

A. It is an acid obtained from cork, by means of the nitric acid. It exists in the form of a powder, and is not crystallizable.

Q. What do you mean by fermentation?

A. I mean that spontaneous intestine change which animal and vegetable substances undergo, when placed under particular circumstances, during which the component principles of the substance enter into new combinations.

Q. What is the red lead of commerce?

A. It is a deutoxide of lead, procured by heat.

Q. How may benzoic acid be procured?

A. By repeatedly boiling together four parts of benzoin, one of lime, and about twenty of water, filtering the solution, and adding to it sulphuric or muriatic acid, until no further precipitate takes place. The precipitate obtained is the benzoic acid. It may be purified by repeated solutions, filtration, and crystallization. Benzoic acid may also be obtained by simple sublimation.

Q. What are its properties?

A. It exists in the form of fine white crystals. It has a pungent, vivid taste, and, when pure, is totally destitute of odour. It is sparingly soluble in cold, but abundantly so in warm water, and also in alcohol, sulphuric, nitric, and acetic acids, from which it may be again separated by the admixture of water. It volatilizes at a moderate heat, and detonates with nitre.

Q. What circumstances are necessary for the process of fermentation to take place?

A. A certain degree of fluidity in the substance; a degree of heat from 55° to 80° Fahrenheit, and the contact of the atmospheric air.

Q. In what form is arsenic found in the shops?

A. In the form of arsenous acid, which is a protoxyde of the metal.

Q. How is the camphoric acid procured?

A. By distilling in a retort eight parts of nitric acid, with one of camphor; repeating the distillation three times on the same residue, with a like quantity of acid; crystals will now be produced, which are the camphoric acid; these are to be redissolved in boiling water, and again crystallized.

Q. What is an ether?

A. It is a peculiar fluid formed by the action of an acid upon alcohol. It is extremely light and volatile; of a peculiar pungent smell, and very inflammable, burning with a bright flame.

Q. What is the red precipitate of mercury?

A. It is a peroxyde of the metal, obtained by exposing the nitrate of mercury to heat.

Q. What are the properties of the white arsenic, or arsenous acid?

A. It is of a white colour, possesses a weak subacid

taste, which slowly manifests itself; and it reddens vegetable blues. If placed on burning coals, or a red-hot iron, it volatilizes in the form of white vapours, which have a strong smell of garlic. It unites with many of the earths and alkalies, forming saline compounds.

Q. How may succinic acid be obtained?

A. It may be obtained by sublimation, from amber. The solid acid thus obtained is to be dissolved in water, filtered, and allowed to crystallize. These operations are to be repeated until the acid becomes nearly colourless.

Q. How many kinds of fermentation are there?

A. There are five: viz. the saccharine, producing sugar; the vinous, producine wine, beer, &c.; the acetous, producing vinegar; the putrefactive, producing ammonia; and the panary, producing bread.

Q. What is emetic tartar, chemically speaking?

A. It is a tartrite of antimony and potass.

Q What is meant by the acetic acid?

A. Acetic acid is the acid produced by the acetous fermentation in a concentrated state.

Q. How are the different ethers distinguished?

A. They are named after the different acids by which they are produced: thus, the ether obtained from sulphuric acid and alcohol, is called sulphuric ether; that from the nitric acid, nitrous ether, &c.

Q. How is the emetic tartar made?

A. The best mode is, by boiling together proper proportions of the pulvis algarothi and supertartrate of potass, in solution, straining the liquor thus obtained, and allowing it to crystallize.

Q. What do you mean by the pulvis algarothi?

A. It is a white oxyde of antimony, which is produced on adding the muriate of antimony to water.

Q. How is the tartarous acid procured?

A. By dissolving in water the supertartrate of potass, and adding carbonate of lime by degrees, until the liquid is saturated; a precipitate now forms, which is the tartrate of lime; very dilute sulphuric acid is to be digested on this for several hours, when the tartarous acid will be set at liberty, and may be cleared from the sulphate of lime by washing in cold water.

Q. What ingredients are necessary to produce the vinous fermentation?

A. Sugar, mucilage, and water.

Q. How is corrosive sublimate of mercury procured?

A. By triturating together equal parts of dry sulphate of mercury, and dry muriate of soda, and exposing the mass to heat, in a glass retort, on a sand bath, a white salt will now sublime, which is the corrosive sublimate.

Q. What is corrosive sublimate, chemically speaking?

A. It is a muriate of the red, or peroxyde of mercury.

Q. What is meant by the lactic acid?

A. It is an acid which exists in the whey of milk, and is obtained by precipitating it by means of lime, in the form of lactate of lime, which is afterwards decomposed by the oxalic acid.

Q. How is alcohol obtained?

A. By repeated distillation from any spirituous liquor.

Q. What is kermes mineral?

A. It is hydrogenated hydro-sulphuret of antimony.

Q. How is it formed?

A. By boiling the sulphuret of antimony in a solution of pure potass, and filtering the liquor while hot; on cooling, the kermes will be precipitated.

Q. How is the sulphur antimonii precipitatum, or the golden sulphuret of antimony, formed?

A. By adding to the liquor obtained by boiling the sulphuret of antimony in a solution of pure potass, diluted sulphuric acid; a precipitate of an orange colour will now be formed, which is the sulphur antimonii precipitatum.

Q. What is meant by the saccho-lactic or mucous acid?

A. It is an acid obtained by means of the nitric acid, from gum arabic, and other mucilaginous substances, and from the sugar of milk. It is in the form of a white gritty powder, with a slightly acid taste.

Q. Can a fluid, after it has undergone the acetous fermentation, be made to undergo a vinous?

A. No; fermentation will only take place in the re-

gular succession from the vinous to the acetous, and from the acetous to the putrefactive.

Q. How may boracic acid be procured?

A. By dissolving any quantity of the sub-borate of soda in boiling water, and adding to this solution sulphuric acid, by a little at a time, until the solution be saturated; it is then to be evaporated slowly to one third, and set aside to cool; white scales will now be deposited, which are the boracic acid. These are to be redissolved, re-crystallized, and lastly, washed, and dried on blotting paper.

Q. What are its properties?

A. It appears in the form of brilliant white scales, which are soft and unctuous to the touch. It has a bitterish taste, with a slight degree of acidity. It is soluble in alcohol, which it causes, when set on fire, to burn with a green flame. It is of difficult solubility in cold water, but is easily dissolved in boiling water. It has no action on combustible bodies.

Q. What is boron?

A. It is a peculiar combustible substance, first discovered by Sir H. Davy, constituting the basis of boracic acid. It is in the form of a very friable powder, of a dark olive colour. It takes fire exposed to the air, at a temperature below the boiling point of olive oil, and burns with a red flame and scintillations, like charcoal. It is a non-conductor of electricity. In oxy-muriatic acid it burns at common temperatures, boracic acid being the result. It decomposes the nitric and sulphuric acids, and boracic acid is produced. It combines with the alkalies and with melted sulphur.

Q. How is calomel made?

A. By rubbing together four parts of corrosive sublimate, and three of quicksilver, and then subliming; or by adding muriatic acid to the nitrate of mercury, and washing the precipitate.

Q. What is calomel, chemically speaking?

A. It is a muriate of the black, or protoxyde of mercury.

Q. What is the uric, or lithic acid?

A. It is an acid existing in the human urine; some

human calculi consist of it entirely. It is a compound of carbon, nitrogen, and oxygen.

Q. How may calomel be distinguished from corrosive sublimate by a chemical test?

A. To a solution of each add ammonia; with the calomel there will be a black, with the corrosive sublimate a white, precipitate.

Q. How is oxalic acid procured?

A. By oxygenizing sugar by means of the nitric acid.

MATERIA MEDICA.

SECTION IV.

Examinations in Materia Medica.

Question. What is the definition of an emetic?

Answer. It is a medicine which excites vomiting by a specific effect upon the stomach, independent of mere distension from quantity, or of any nauseous taste or smell.

Q. Give a list of the principal emetics.

A. The principal emetics are, the emetic tartar (tartris antimonii), ipecacuanha, the white vitriol (sulphas zinci), and the blue vitriol (sulphas cupri).

Q. Give a list of the principal native vegetables which have emetic properties?

A. The powdered leaves of the lobelia inflata, of the spirea trifoliata, and of the euphorbia ipecacuanha.

Q. What do you mean by cathartics?

A. Cathartics are those medicines which have the effect of evacuating the intestines downwards; and when they effect this to any considerable degree, it is called a purging.

Q. What is the dose of emetic tartar?

A. For an adult, from two to five grains, in divided doses.

Q. What do you mean by diaphoretics?

A. They are those medicines which promote the discharge by the skin, whether by insensible or sensible perspiration.

Q. When is it improper to administer emetics?

A. They are improper when the stomach is affected with active inflammation, or has a great tendency to spasm; in the latter stage of pregnancy, and in cases of a very full habit, or where there exists a determination to the head; here bleeding should always be premised.

Q. What is the dose of ipecacuanha as an emetic?

A. From fifteen to twenty grains of the powdered root.

Q. What is the dose of the white vitriol as an emetic?

A. It is generally employed in cases of poison, where from one to two drachms should be administered, according to circumstances.

Q. What are the principal cathartics?

A. They are calomel, jalap, rhubarb, magnesia, castor oil, sulphur, senna, aloes, gamboge, scammony, hellebore, elaterium, supertartrate of potass, and the Glauber's, Epsom, Rochelle salts, &c.

Q. What are the principal native cathartics?

A. The leaves of the cassia marilandica, the root of the podophyllum peltatum, an extract from the inner bark of the juglans cathartica, &c.

Q. What is the dose of ipecacuanha as a diaphoretic?

A. From half a grain to two grains.

Q. What is the composition of Dover's powders?

A. They consist of ten parts of the sulphas potassæ, one of ipecacuanha, and one of opium.

Q. What is the dose of Dover's powders?

A. Ten grains.

Q. What is the dose of emetic tartar as a diaphoretic?

A. From an eighth to a quarter of a grain.

Q. What is the composition of the nitrous, or antimonial powders.

A. They are composed of one drachm of nitre and one grain of emetic tartar, for eight powders.

Q. What is the dose of rhubarb?

A. From twenty to thirty grains of the powdered root.

Q. What are diuretics?

A. Diuretics are medicines suited to promote the secretion of the urine by the kidneys.

Q. What is the dose of jalap?

A. From fifteen to thirty grains of the powdered root.

Q. What are the general rules to be attended to in the use of diaphoretics?

A. 1st. If the patient's pulse be strong, and the heat of the skin considerable, these must be reduced by bleeding, &c. previously to the administration of diaphoretics. 2d. During the operation of the diaphoretic, the patient must be confined entirely to bed. 3d. To excite the action of the medicine, warm diluent drinks should be freely allowed. 4th. Where sweating is to be kept up for some time, the clothing of the patient should be flannel. Finally, carefully guard against a sudden suppression of the perspiration.

Q. What is the dose of calomel?

A. From six to fifteen grains.

Q. Give a list of the principal diuretics.

A. The principal diuretics are, the supertartras potassæ, the carbonates of the fixed alkalies the nitras potassæ, the sweet spirits of nitre, digitalis, squill, polygala senega, the tincture of cantharides, colchicum, balsam copaiva, tinctura muriatis ferri, &c.

Q. What is the dose of the fixed alkalies as antilithics?

A. From ten to twenty grains.

Q. What is the dose of the supertartras potassæ as a diuretic?

A. One ounce in solution, to be given in divided doses.

Q. What is the dose of aloes as a cathartic?

A. From five to fifteen grains.

Q. What is the dose of nitre as a diuretic?

A. From ten to thirty grains.

Q. What is the dose of the nitric and muriatic acids as antilithics?

A. From fifteen to sixty drops.

Q. What are the principal diaphoretics?

A. The emetic articles, generally, in minute doses: the nitrate of potass, guaiacum, polygala senega, mezereon, sarsaparilla, citrate of potass, citrate and acetate of ammonia, sulphur, &c.

Q. What is the dose of magnesia as a cathartic?

A. From twenty to thirty grains.

Q. What do you mean by an antilithic?

A. Antilithics are those articles which have a tendency to correct the lithic diathesis existing in the system, and thereby prevent the formation of urinary calculi.

Q. What is the dose of the volatile tincture of guaiacum as an emmenagogue?

A. About one drachm.

Q. What is the dose of the carbonated fixed alkalies as diuretics?

A. From about ten to fifteen grains.

Q. What is the dose of magnesia as an antilithic?

A. From ten to thirty grains.

Q. In what manner is senna in general prescribed as a cathartic?

A. In infusion, combined with mannæ, cream of tartar, and some aromatic, and sometimes with rhubarb, tartar emetic, an alkali, &c. Either of the following are excellent formulæ:

℞. Folior. sennæ, oz. ss. to oz. i. Mannæ opt. dr. iij—iv. Sem. coriand. dr. j. Sup. tart. pot. dr. iij. Aquæ fervent. ℔ j. M. Digere per horas quatuor.

℞. Folior. sennæ, dr. ij. Mannæ, oz. jss. Pulv. rhei, dr. i. Sup. tart. pot. dr. jss. Sem. coriand. dr. jss. Aq. fervent. oz. vj. M. et digere per horas quatuor.

Q. What is meant by an emmenagogue?

A. Emmenagogues are medicines given with the view of exciting the menstrual discharge.

Q. What is the dose of digitalis as a diuretic?

A. From one to three grains of the powdered leaves, and from ten to twenty drops of the tincture.

Q. What are the principal antilithics?

A. The principal antilithics are the carbonated fixed alkalies, the super-carbonated alkalies, the aqua potassæ, lime, magnesia, the carbonic, nitric, and muriatic acids, the hop, &c.

Q. What is the dose of ergot as an emmenagogue?

A. From twenty to thirty grains in powder.

Q. How is the saline draught prepared?

A. About two ounces of lemon juice is saturated with

carbonate of potass; after which, four ounces of water, and a sufficient quantity of sugar, are added.

Q. What is the dose of squill as a diuretic?

A. From two to three grains in powder.

Q. What are the principal emmenagogues?

A. They are ergot, savine, tincture of cantharides, calomel, volatile tincture of guaiacum, tinctura melampodii, polygala senega, aloes, and the preparations of steel, &c.

Q. What do you mean by anthelmintics?

A. Anthelmintics are such medicines as destroy or expel worms infesting the human body.

Q. What is the formula for the castor oil, or oleaginous mixture?

A. ℞. Ol. ricini, oz. iss. Sacch. alb. et gum Arab. āā dr. ij. Aq. menth. oz. ss. Aq. fontanæ, oz. iij. The water, gum, and sugar are to be rubbed together in a mortar to the consistence of a thin syrup, when the castor oil is to be gradually added, and well rubbed in, and then the residue of the ingredients: unless the above directions are observed, the oil and water will not form a perfect emulsion. When required, a proper quantity of laudanum can be added to the above mixture. The dose is a table spoonful every two hours.

Q. What is meant by narcotics?

A. They are medicines which diminish the sensibility and irritability of the system, allay pain, and induce sleep.

Q. What is the dose of cantharides as a diuretic?

A. From ten to thirty drops of the tincture.

Q. In what does the narcotic principle of opium consist?

A. In an alkaline salt called *morphia*.

Q. To what does ipecacuanha owe its active principle?

A. To a substance called *emetine*, which, when pure, is of a reddish brown colour, solid, nearly inodorous, and of a slight bitter acrid taste.

Q. Give a list of the principal anthelmintics.

A. They are calomel, the oil of the chenopodium anthelminticum, or the leaves in infusion, the spigelia, the

bark of the cabbage tree, the root of the male fern, cowhage, the root of the melia azedarach, oil of turpentine, and the different preparations of iron.

Q. What do you mean by antispasmodics?

A. Antispasmodics are medicines which have the power of allaying or removing inordinate motion in the muscular system.

Q. Which are the principal narcotics?

A. They are opium, hyoscyamus, cicuta, stramonium, belladonna, tobacco, and the hop.

Q. What is the formula for the cretaceous mixture?

A. ℞. Creta p. p. t. 1 oz. Gum. arab. 2 dr. Sacch. alb. 1 dr. Ol. cinnamon. 6 gtt. Aq. commun. 12 oz. M. To this may be added, if required, tinctura opii half a drachm to one drachm, according to circumstances.

Q. How is the tinctura opii made?

A. By digesting one ounce of opium in one pound of proof spirits for four days, then straining.

Q. What are the ingredients which enter into the the common or domestic enema?

A. Castor oil, olive oil, or goose grease, about one ounce; molasses, half an ounce; common salt, one to two drachms; and tepid water, from a half a pint to a pint.

Q. In what does the active principle of the colchicum autumnale consist?

A. In a peculiar alkali, which is found also in the root of the white hellebore, and has been named *veratrine*.

Q. What substances will decompose calomel?

A. The alkalies, and their carbonates, nitric acid, sulphuretted hydrogen, lime water, iron, lead, copper, hydro-sulphurets, &c.

Q. How is the tincture of cantharides made?

A. By digesting one drachm of the cantharides in a pound of proof spirits for three or four days, then straining.

Q. How is the liquor arsenicalis, or Fowler's solution, obtained?

A. By taking sixty-four grains of prepared oxyde of arsenic, sixty-four grains of the sub-carbonate of potass,

and half a pint of distilled water; these are to be boiled in a glass vessel until the arsenic is perfectly dissolved; when cold, half an ounce of the compound spirits of lavender, and as much distilled water as shall be required to make the whole measure exactly one pint, are to be added.

Q. In what does the active principle of Spanish flies consist?

A. In a peculiar substance which has received the name of *cantharidin*.

MIDWIFERY.

SECTION V.

Examinations in Midwifery.

Question. Which is the *longest* diameter of the pelvis, and what does it measure?

Answer. In the living subject, the diagonal diameter, or a line drawn from the sacro iliac symphysis to the opposite acetabulum is the longest, it measures about five inches and an eighth.

Q. Which is the *longest* diameter of the fœtal head, and what does it measure?

A. The longest diameter is from the vertex to the chin, and measures about five inches.

Q. How deep is the pelvis at the *sacrum?*

A. From five to six inches, according as the coccyx is more or less extended.

Q. Which is the *shortest* diameter of the pelvis, and what does it measure?

A. The shortest diameter of the pelvis is from the symphysis pubis to the projection of the sacrum, measuring four inches.

Q. Which is the shortest diameter of the outlet of the pelvis, and what does it measure?

A. The shortest diameter of the outlet is from one tuberosity of the ischium to the other, measuring four inches.

Q. What is the measurement of the fœtal head, from the root of the nose to the vertex?

A. Four inches.

Q. What is the depth of the pelvis at the *symphysis pubis?*

A. About an inch and a half.

Q. What does the outlet of the pelvis measure from the pubis to the coccyx?

A. When the coccyx is pushed back it measures five inches, but one inch less when it is not.

Q. What does the fœtal head measure from the nape of the neck to the vertex?

A. Three inches and a half.

Q. What is the measurement of the *lateral* diameter of the pelvis?

A. In the skeleton about five inches and a quarter, but somewhat less in the living subject.

Q. What does the fœtal head measure from one parietal protuberance to the other?

A. Three inches and a half.

Q. What does the fœtal head measure from occiput to chin along its base?

A. Four and a half inches.

Q. How many inches does the fœtus measure across the shoulders?

A. Five inches.

Q. Where is the seat of conception?

A. In the ovaria.

Q. How soon after conception does the ovum pass into the uterus?

A. In about three weeks.

Q. By how many membranes is the fœtus in utero enveloped?

A. By the amnion, the chorion, and decidua reflexa.

Q. Of how many parts does the placenta consist?

A. Of two; the fœtal, or the external, with respect to the cavity of the uterus, composed of the ramifications of the vessels of the chord, and an internal adhering to the uterus, composed of the ramifications of the maternal vessels; these two portions are connected together by a cellular substance.

Q. Do the vessels of these two portions of the placenta communicate?

A. They have no direct communication; for injec-

tions thrown in from the maternal vessels will not pass into the vessels of the fœtal portion, and vice versa.

Q. Of how many vessels is the chord composed?

A. Of two arteries and one vein.

Q. Describe the fœtal circulation.

A. The blood being brought from the placenta by the umbilical vein, passes into the fœtal abdomen at the umbilicus, and through a duplicature of the falciform ligament of the liver to the anterior side of the sinus of the vena portarum; from the opposite side of the sinus arises the ductus venosus, which carries the blood to the left hepatic vein, through which it passes into the ascending cava, and thence to the right auricle of the heart. The Eustachian valve directs a portion of the blood of the inferior cava into the left auricle of the heart, through the foramen ovale, to be sent to the head. The blood of the right auricle passes into the pulmonary artery, but, in place of being distributed to the lungs, passes through the canalus arteriosus, which arises near the bifurcation of the pulmonary artery, into the aorta, and is, together with the blood from the left side of the heart, distributed over the body. The blood is carried back to the placenta by the two internal iliacs, which, in the fœtus, pass up on each side of the bladder, and proceeding through the umbilicus, constitute the arteries of the chord.

Q. What is meant by the term quickening?

A. A peculiar motion or sensation in the womb, which is perceived by pregnant women about the fourth month.

Q. Upon what does this sensation depend?

A. It is occasioned by the uterus at this period suddenly rising above the brim of the pelvis, and encroaching upon the cavity of the abdomen.

Q. Upon what causes does sterility depend?

A. Upon a malconformation, or a deficiency of the sexual organs, or upon the functions of these organs being disordered or imperfectly performed, or upon organic disease of the parts, or a great exhaustion of them, arising from frequent and promiscuous venery.

Q. What do you mean by extra-uterine pregnancy?

A. When the ovum, in place of being conveyed to the

uterus, is either retained in the ovarium, or in the tube, or escapes into the cavity of the abdomen, where the fœtus developes itself.

Q. Which of these species of extra-uterine pregnancy is the most frequent?

A. That in which the ovum is retained in the tube.

Q. What are the symptoms of extra-uterine pregnancy?

A. In general, they are those of common uterine pregnancy; they are, however, more violent, and do not cease so early; sometimes, on the contrary, they increase as pregnancy advances. The menses are not interrupted, at least in the first three months.

Q. How does extra-uterine pregnancy terminate?

A. Either by the sac bursting, and the consequent hæmorrhagy destroying the woman; or, if this should not happen, the fœtus may escape through the rupture into the abdomen, and become enclosed in a cyst, where it may be retained for many years without much inconveniency; the woman even becoming again pregnant. The most common termination, however, is by the sac taking on inflammation and adhering to the neighbouring parts; suppuration coming on, the fœtus, in a putrid state, is discharged either into the intestines, through the sides of the vagina, or externally.

Q. What do you mean by a retroversion of the uterus?

A. It is an accident occurring to the impregnated uterus, by which its fundus is thrown downwards and backwards in the hollow of the sacrum, while the os uteri is directed upwards and forwards towards the symphysis pubis.

Q. How is retroversion of the uterus caused?

A. It is caused by a retention of the urine; the bladder, as it becomes distended and rises into the abdomen, draws with it the neck of the uterus, to which it is attached, and at the same time throws back the fundus.

Q. At what period of pregnancy can it take place?

A. At any time between the third and fourth months.

Q. Why cannot it take place after the fourth month?

A. Because at this period the uterus has increased so much in size, that it has risen out of the pelvis, into the

cavity of which it cannot again pass until its contents are expelled.

Q. How is a retroversion of the uterus to be treated?

A. In general, all that is required is to draw off the urine with a catheter twice each day, and the uterus, as it enlarges, will regain its natural position.

Q. What is meant by an abortion?

A. By an abortion is meant the expulsion of the fœtus during any of the first six months of gestation.

Q. What are the general signs of pregnancy?

A. The first circumstances which lead a woman to suspect herself pregnant, are the suppression of the menses and an irritable and dyspeptic state of the stomach, particularly in the mornings; soon after this the breasts enlarge, and are occasionally painful; and the nipple becomes surrounded with a brown circle or areola; the woman becomes paler, and the under part of the lower eyelid has a leaden hue; the features become sharper, and sometimes the body begins to be emaciated, while the pulse becomes quicker; in many instances peculiar symptoms take place, causing salivation, toothache, &c.; in other cases but little disturbance is produced, and the woman has no certainty of her condition until the time of quickening.

Q. What is meant by false pains?

A. They are pains arising in the latter period of gestation, from various causes, and in some degree resembling those of labour.

Q. How are they to be distinguished from true labour pains?

A. By their occurring at irregular intervals; by their affecting the belly more than the back and sides, and by their producing no dilatation of the os uteri.

Q. How are they to be relieved?

A. If they arise from costiveness, by laxatives; if from acidity in the stomach and bowels, by absorbents; if from spasm or fatigue, by opiates; and if from inflammation or fever, by bleeding, &c.

Q. How many presentations of the head are there?

A. There are six; in the 1st, the posterior fontanelle presents behind the left acetabulum, and the anterior opposite the right sacro iliac symphysis; in the 2d, the

posterior fontanelle is behind the right acetabulum, and the anterior before the left sacro iliac symphysis; in the 3d, the posterior fontanelle presents to the pubes, and the anterior to the projection of the sacrum; the 4th, 5th, and 6th presentations, are the reverse of the above; the anterior fontanelle being in the situation of the posterior, and the posterior in the situation of the anterior in the 1st, 2d, and 3d presentations.

Q. How is the anterior distinguished from the posterior fontanelle?

A. By the anterior having four angles, and a suture proceeding from each angle, while the posterior has but three angles, and three sutures proceeding from it.

Q. Define a natural labour.

A. A natural labour is one which takes place at the end of nine months, in which the vertex presents, and the head passes readily into the pelvis, taking such a turn as to bring the occiput out under the arch of the pubis; the labour terminates within twenty-four hours after its commencement; the placenta is expelled within an hour after the birth of the child, and the whole process is passed through without danger to the mother.

Q. Into how many stages is labour divided?

A. Into four: 1st, the passage of the head into the pelvis; 2d, its passage through the pelvis; 3d, the expulsion of the child; and, 4th, the expulsion of the placenta.

Q. What are the precursory symptoms of labour?

A. First, a regular subsidence of the abdomen; 2d, a discharge of a mucous fluid from the vagina; 3d, frequent gripings or tenesmus; and, 4th, a frequent desire to void the urine.

Q. During the dilatation of the os uteri, what kind of pains attend?

A. Those of a sharp, grinding, or cutting nature.

Q. What kind of pains accompany the expulsion of the child?

A. Bearing down, or forcing pains.

Q. What should be the position of the woman during the two first stages of labour?

A. She may be allowed to occupy any position in which she feels most at ease; if she becomes fatigued,

she should occasionally repose upon the bed or a couch; but it is not expedient, during these two stages, that she should remain very long at a time in a recumbent posture.

Q. What food is most proper for a woman during labour?

A. Such only as is of a mild nourishing nature, such as tea, coffee, gruel, barley water, milk and water, &c. Of these moderate quantities should be occasionally allowed, but all spirituous or fermented liquors must be strictly forbidden.

Q. By what means does the practitioner ascertain the progress of labour?

A. By ascertaining the state of the os uteri, and of the presenting part of the child by examination with the finger.

Q. Should we make our examination during or in the absence of a pain?

A. The finger should be introduced during a pain, and retained in until the pain goes off, by which means we ascertain the effect produced on the os uteri, and the degree to which it afterwards collapses, and also the exact situation of the presenting part, which cannot be done during a pain, lest we prematurely rupture the membranes.

Q. In the commencement of labour, where do we find the os uteri?

A. In general, directed backwards towards the sacrum.

Q. What is felt between the pubes and os uteri?

A. A tumor formed by the neck of the uterus, upon which the presenting part of the child rests, and which, as labour advances, diminishes in breadth until entirely obliterated.

Q. How is the parturient female to be placed in the two last stages of labour?

A. Towards the close of the second stage she should be placed, on a bed properly made up and secured, upon her left side, her legs and thighs somewhat drawn up, and a pillow placed between her knees.

Q. When the head of the child begins to protrude at the os externum, what is to be done?

A. The accoucheur should place his hand, covered by a soft cloth, in such a manner on the perinæum, as to support and guard it from laceration during the expulsion of the head, and also of the shoulders.

Q. After the child is completely expelled, what is next to be done?

A. Whenever it has breathed freely and cried vigorously, a ligature should be put on the chord, at the distance of an inch or so from the belly, and another an inch nearer the placenta, and the chord divided between them with a pair of sharp scissors.

Q. If the placenta be not expelled in the usual time after the delivery of the child, what conduct should the practitioner pursue?

A. He should first endeavour to excite the contraction of the uterus by rubbing the belly over it, or by pressing it gently with his hand; should this not induce the expulsion of the placenta, and an hour has elapsed since the birth of the child, the accoucheur should proceed to extract it with the hand.

Q. How is the extraction of the placenta to be conducted?

A. The patient lying still on her left side, with the breech very near the edge of the bed, her belly is to be moderately pressed by an assistant, while the practitioner, uncovering his arms, is to take hold of the chord with his left hand, while he slowly passes his right, previously smeared with lard, into the uterus, making the funis his guide; this action is often sufficient to excite the action of the uterus, and occasion the separation of the placenta; but if not, the hand is to be passed on to the placenta, and pressed gently against it, while the chord is slightly pulled; when the placenta is by this means separated, it is to be taken hold of, and very slowly extracted. If, on introducing the hand, it be found that the placenta is retained by a spasmodic contraction of the uterus at its middle, this contraction is to be gradually overcome by continued attempts to introduce one, two, or more fingers through it.

Q. What is the proper treatment of the patient after delivery?

A. After she is somewhat recoved from her fatigue, she should be gently turned on her back, and have a wide bandage passed around her abdomen, and tightly pinned on; after this the wet bed-clothes are to be removed, and such parts of her dress as have been soiled should be taken off, and their place supplied with others; in doing this, we are carefully to avoid raising the patient from the horizontal position; by neglecting this caution much danger will be incurred, even the death of the patient may be occasioned by it.

Q. How is labour rendered tedious or lingering by a weakness of habit in the mother, inducing an inert, irregular, or partial action in the uterus, to be treated?

A. Much time should be allowed for the parts to develope themselves, the patient's strength being supported by mild nourishment, such as gruel, arrow-root, panada, chocolate, &c. and, if the pulse allow of it, with the addition of a little wine; the bowels are to be opened by clysters; the patient should be kept cool, and frequently change her position; as soon as the parts are sufficiently dilated, we may administer twenty grains of powdered ergot, and, if it fail to produce sufficient contraction of the uterus in the course of half an hour, the dose shonld then be repeated.

Q. In a tedious labour, arising from rigidity of the os uteri, and other parts concerned in parturition, what is to be done?

A. Time should be allowed; the patient being kept in an erect posture as much as possible, without fatiguing her; her diet should be light; the state of the bladder is to be carefully attended to, that it may not become over distended, and the bowels must be kept regular by castor oil or salts. If the patient be of a robust habit, bleeding, to some extent, will be found beneficial.

Q. In the presentation of the anterior fontanelle to the right or left acetabulum, can any thing be done to accelerate the labour?

A. Yes; the prescntation may be converted into either the first or second, and the labour thus rendered much less tedious and dangerous, by applying the fingers to the side of the child's forehead, and pressing the an-

terior fontanelle towards the sacro iliac symphysis, to which it is inclined.

Q. How many presentations of the face are there?

A. Principally four: viz. with the chin to the pubes, with the chin to the sacrum, or with the chin to one or other sides of the pelvis.

Q. How are these presentations to be managed?

A. We are directed, if possible, to introduce the lever, or one blade of the forceps, over the occiput, and draw it down, while with two fingers we push up the chin; by this means we are enabled to convert them into presentation of the vertex, when they are to be treated accordingly.

Q. What is meant by a preternatural labour?

A. A labour in which any part of the child except the head presents.

Q. On examining at an early period of labour, what would induce you to suspect a mal-position of the child?

A. If the os uteri be considerably dilated, and yet the child cannot be felt; the liquor amnii being discharged, while the child remains beyond the reach of the finger; the membranes being found hanging down in the vagina of a conical form, and small in the diameter, and especially if the presenting part, when felt through them, be smaller, lighter, and give less resistance when touched than the bulky head.

Q. How is a presentation of the feet distinguished?

A. By feeling, upon examination, the heel and great toe; by the shortness of the toes, and their ends forming nearly an even line.

Q. How is a footling case to be managed?

A. The management is to be left entirely to nature until the nates are born, when, if the back of the child present towards the back of the mother, it becomes necessary for the accoucheur to take hold of both the thighs of the child with a warm napkin, and, during the next pain, to give such an inclination to the infant's body, as will direct the face towards the mother's spine; during the same pain, in which the practitioner produces this turning of the child, the whole body will probably be expelled, leaving only the head in the pelvis, with the arms extended on each side of it over the ears.

It will be better next to bring down the arms, by passing the finger over the child's shoulder as far as the bend of the elbow, which is then to be gently depressed, and the fore arm will in general pass through the vagina without much difficulty; one arm being brought down, the extraction of the second is rendered more easy.

Q. Should the expulsion of the head be now left to nature?

A. As the death of the child will be inevitable, from the circulation in the chord being put a stop to by compression on it, if the head remain any time in the pelvis, we should therefore, when the labour has proceeded so far, that only the head remains to be born, extract this as speedily as circumstances will admit.

Q. How is this extraction to be effected?

A. The left hand of the accoucheur is to be introduced into the uterus, and the fore-finger being insinuated into the mouth of the child, the fore and middle fingers of the right hand are to be passed over the nape of the neck, one finger resting on each shoulder; the child being supported on the practitioner's left hand and arm, a moderate extracting force is now to be employed to bring forth the head. This will sometimes be more conveniently done, if the woman be turned on her back, and the operator stand up. The extraction should be attempted during a natural pain, and discontinued as soon as the pain goes off, but in urgent cases the extraction must be made without waiting for the pains. The operator is to be careful not to use too much force in his attempts, otherwise he may strain and injure the child's neck, or if he keep the parts constantly on the stretch, he will so completely compress the chord as to stop the circulation and destroy the child.

Q. How are presentations of the nates distinguished?

A. They are distinguished by the softness, pulpiness, and globular shape of the presenting part; by the cleft between the buttocks, and by the parts of generation.

Q. How is a breech presentation to be managed?

A. During the expulsion of the breech by the efforts of the uterus, the perinæum is to be supported, and nothing more is to be done until the knees are so low as to be on a line with the os externum; if they do not

now naturally bend, and the feet pass out, the finger of one hand is to be employed to bend the leg, and bring down the foot; the knee, in this process, pressing obliquely over the abdomen of the child, the perinæum during the whole time being carefully protected from being injured. The case becomes now precisely the same as a footling presentation, and is to be treated in exactly the same manner.

Q. How are presentations of the shoulder, arm, side, &c. to be managed?

A. The accoucheur is to introduce his hand into the uterus, and, taking hold of the feet, bring them without the os uteri, thus converting the case into a presentation of the feet, when it is to be managed accordingly.

Q. At what period of the labour should the hand be introduced, in order to turn the child?

A. It should be introduced previously to the rupturing of the membranes, but not until the os uteri is sufficiently dilated: as a general rule, we may say that the proper time for delivery by the feet is "when the os uteri has become dilated to the size of half a crown, and is at the same time thin and lax."

Q. What are the cautions to be attended to, in delivering by the feet?

A. 1st, While the hand is in the uterus, not to act during a pain, but to keep the hand, in a flattened form, close to the body of the child; 2d, in cases of twins, to be careful that both the feet we have hold of belong to the same child; 3d, to bring down the feet over the belly of the child, not over its back, and with the toes presenting to the back of the mother.

Q. Provided, in a case of labour requiring turning, the waters have been evacuated, and the uterus has contracted strongly on the child, what is to be done?

A. No attempt should now be made to introduce the hand, but we should endeavour to relax the action of the uterus by bleeding, where admissible, followed by a large dose of laudanum; as soon as the action of the uterus becomes suspended, the earliest opportunity is then to be taken to deliver.

Q. How are we to conduct a case of twins?

A. As the existence of twins cannot be ascertained previously to the birth of the first child, this is of course to be conducted precisely as though there was but one child in the uterus; immediately after the birth of a child, the practitioner should in every case satisfy himself that there is no other remaining, by placing his hand upon the woman's abdomen, or by introducing a finger or two into the uterus. If there be a second child to be delivered, and it presents in such a manner as to require manual assistance, or if convulsions, hæmorrhage, or any other accident has occurred in the interval between the two labours, or if the first labour has been preternatural, very difficult, or dangerous, the practitioner should terminate the second labour as quickly as circumstances will admit. If, however, the second child present naturally, and the labour of the first has terminated without artificial assistance, or without much fatigue to the patient, the pains come on, in general, soon after the expulsion of the first child, and the second is quickly expelled. Should the pains not, however, come on in a reasonable time, the practitioner should, after waiting from one to three hours, according to circumstances, rupture the membranes, when he will commonly find the second child will pass readily through the pelvis; if this, however, be not the case, and the head continue high up, he is to turn and deliver by the feet.

Q. How are presentations of the funis to be managed?

A. In general, the best practice is to introduce the hand into the uterus, and deliver by the feet; it is to be recollected that the danger in these cases is entirely on the side of the child, the operation of turning is therefore not to be resorted to if the child is dead, or if there be no well-grounded hopes of saving by it its life.

Q. What are the symptoms attending a rupture of the uterus during labour?

A The woman has a sensation of something giving way internally, preceded by a very sharp pain, generally described as a cramp; this is succeeded by an immediate cessation of the labour pain, by great languor and debility, frequently an instantaneous expulsion of the contents of the stomach, or a vomiting of a brownish fluid, a very quick, weak, and fluttering pulse, a cold

sweat, and great difficulty of breathing. Upon introducing the hand per vaginam, it will in general be found that the presenting part of the child, which had previously advanced some way into the pelvis, is no longer within the reach of the finger, the child having passed entirely or partially into the abdomen.

Q. What is our proper conduct in such a case?

A. The hand, if the os uteri be sufficiently dilatable, should be introduced, and if the child has only in part passed into the cavity of the abdomen, the feet, if within reach, are to be taken hold of, and brought down; or, if the head of the child be so situated as to admit of the application of the forceps, the delivery is to be effected by them. Even if the child has passed completely through the rent, it will be proper to deliver it by taking hold of the feet, provided the hand can be easily introduced into the cavity of the abdomen, and the accident has not been of long duration, otherwise the case must be left to nature. After delivering the child, we should carefully examine, in order to ascertain that none of the intestines have passed through the rupture.

Q. What circumstances occasion a hæmorrhage to take place during labour?

A. Either the accidental separation of the placenta to a greater or less extent, or its being attached over the cervex uteri.

Q. How is hæmorrhagy arising from the first cause to be treated?

A. The patient is to be placed in a horizontal posture, but lightly covered with bed clothes: the windows and doors of the room are to be opened: cloths dipped in cold water should be applied to the abdomen and pubes, or even pounded ice itself, inclosed in a bag. Should the patient be costive, a pint of cold water, with a little salt, may be injected into the rectum; diluted sulphuric acid may be freely administered in an infusion of roses, or the sugar of lead may be tried in doses of from three to five grains, combined with a small quantity of opium, and repeated according to circumstances.

Q. Provided these measures be incompetent to suppress the hæmorrhagy, what must then be done?

A. In general, we shall succeed in diminishing or suspending the flooding by rupturing the membranes, and evacuating the waters as soon as a disposition to labour comes on; the uterus will now contract on the child, which will, commonly in a few hours, be expelled by the natural pains.

Q. How is hæmorrhagy from an implantation of the placenta over the os uteri, to be managed?

A. The usual means for checking the hæmorrhagy are to be adopted, until the os uteri has a proper degree of softness and dilatability, when the hand of the accoucheur is to be passed into the uterus. If only a portion of the placenta adhere over the os internum, the hand will pass by the side of it, but if the os uteri be entirely closed by it, a perforation must be made through its substance with the fingers; the hand is now to be passed on, until it reach the membranes, which are to be ruptured, and the child turned in the usual way.

Q. What are the symptoms of puerperal convulsions?

A. In cases of true puerperal convulsions, the woman suddenly loses all sensation, and stretches herself out, every muscle becomes rigid, and a rattling is heard in the throat, the muscles are speedily afterwards thrown into violent convulsions, the face is livid and distorted, the eyes are protruded, the woman gnashes her teeth and foams at the mouth, and a sharp hissing sound is produced by her breathing through the closed teeth and the foam. This state of convulsion, after lasting for some time, gradually ceases, and the patient is left in a kind of stupor, during which the breathing is stertorous. In the course of half an hour or so, if there be no return of the convulsions, she gradually recovers her recollection; and now complains of great pain in her head, and a soreness of her limbs; there is a heaviness of her countenance, a change in the tone of her voice, and a kind of stupidity, which is premonitory of a second attack, which in almost every instance takes place. Sometimes there is no return to any degree of recollection, but one fit follows another for hours, or even days, without any perfect intermission.

Q. How are puerperal convulsions to be treated?

A. From thirty to forty ounces of blood should be immediately taken from the patient's arm, or the jugular veins, and drawn off suddenly by a large orifice. The bleeding should be repeated again and again, as long as the symptoms remain with but little abatement. If the patient is able to swallow, a large dose of calomel should be administered, and followed in the course of half an hour by a solution of salts, or an infusion of senna. If the cathartic cannot be administered by the mouth, which is generally the case, a strong purgative clyster must be injected, and repeated if necessary. The head should now be shaved, and cold applications made to it, and, if the symptoms continue, a large blister. The practitioner should now consider whether it will be proper to leave the expulsion of the child any longer to nature; if labour be proceeding quickly, it will not, perhaps, be necessary to interfere; but if the pains are slow, it is generally proper, as soon as the head comes within reach of the forceps, to apply them, and deliver without further delay.

Q. In what cases of labour are the forceps to be resorted to?

A. In every case where it is fully ascertained that the natural efforts of the uterus are incompetent to effect the delivery of the child; this may arise from either a want of power in the uterus, or from a deformity in the parts of the mother, or of the head of the fœtus. 2dly, In such cases, where, from certain occurrences, such as hæmorrhagy, convulsions, &c. the speedy delivery of the child is required.

Q. How soon should the forceps be had recourse to?

A. Never until the ear of the child, which is nearest the pubes, can be felt; and it is also laid down as a rule, that, except in cases of hæmorrhagy, convulsions, &c. they should never be applied until the ear has remained within reach for at least six hours, during that time the head making very little or no progress.

Q. What are the rules to be attended to in the introduction of the forceps?

A. 1st. Always to introduce them in the axis of the superior strait, or in a line from the coccyx towards the umbilicus. 2d. To apply the concavity of the forceps

over the convexity of the head. 3d. In their application to keep their points closely applied to the child's head. 4th. To use no force in their introduction; and 5th, on locking the blades, to be careful that we do not include in the lock any of the soft parts of the mother.

Q. Describe the mode of introducing the forceps.

A. Having placed the patient on her left side, with the nates close to the edge of the bed; the bladder and rectum having been previously emptied, we are to introduce the fore finger of the right hand, until it reaches the child's ear which is nearest the pubes, then taking one blade of the forceps in the left hand, it is to be introduced into the vagina, and cautiously carried along the concavity of the hand until it passes over the ear of the child, beyond which it is to be gently insinuated, until the lock of the instrument passes just within the os externum; the right hand is now to be withdrawn, and the left introduced within the os uteri, on the opposite side of the head, and along this the other blade of the forceps is to be passed over the opposite ear of the child; the accoucheur not being able to feel this ear, is to be guided in the introduction of the second blade, in a great measure, by the position of the first; both blades being thus introduced, the handles are to be brought together and locked.

Q. If, after introducing the forceps, it is found that the handles remain some distance from each other, what are we to infer?

A. Either that the forceps embrace the head in a wrong direction, or that the head is seized only by their points; no force should therefore be used to bring them together, but the second blade should be withdrawn, and again introduced.

Q. Should the handle of the forceps, after their application, come readily in contact throughout their whole length?

A. No; when this happens, therefore, we may depend upon it that the head is not properly included within the blades of the forceps.

Q. In what direction should we act with the forceps?

A. Always from handle to handle, consequently, previously to the head taking the turn of the pelvis, the

handles should be moved from sacrum to pubis, but after the head has turned, from one tuberosity to the other.

Q. What cases of labour require the use of the perforator and crotchet?

A. Where the disproportion between the head of the child and the size of the pelvis is so great that it is impossible for the head to pass through without being reduced in size; and this may arise from either a distortion of the pelvis, or the enormous size of the child's head.

PRACTICE OF MEDICINE.

SECTION VI.

Examinations on the Practice of Medicine.

Question. What is the definition of a fever?

Answer. It is a disease marked by an increased heat of the body, and a frequency of the pulse, coming on after a sensation of some degree of cold or shivering, and attended with a disordered state of several of the functions, and a diminution of power in the muscles subservient to the will.

Q. What are the general symptoms of an inflammation of the brain, or phrenitis?

A. They are a violent fever, severe deep seated pain in the head, a redness and turgescence of the face and eyes, and an intolerance of light and noise, a constant watchfulness, and a furious delirium.

Q. What are the general outlines of the treatment of phrenitis?

A. Prompt and copious bleeding, repeated at short intervals, until the violence of the disease is subdued, followed by active purgatives. The head is to be shaved, and cold should be applied to it; after general bleeding, cups to the temples will be proper; and as soon as the action of the blood vessels is somewhat reduced, a blister is to be applied, large enough to cover the whole head; this, together with the use of the antimonial powders, and the strictest adherence to the antiphlo-

gistic regimen, constitutes the mode of treating this formidable disease.

Q. What is meant by intermittent fever?

A. It is a fever in which there is a succession of paroxysms, between which there is a perfect interval, in which the patient is free from all febrile symptoms.

Q. What are the ordinary symptoms observed during the *cold stage* of intermittent fever?

A. It commences with languor, a sense of debility, disinclination to motion, frequent yawning and stretching, aversion from food, &c. The face and extremities become cold, and the whole surface of the body shrinks, as from the application of cold. The patient feels very cold, and universal rigors come on—the respiration is small, frequent, and anxious—the pulse frequent, small, and often irregular—the urine is colourless, and the sensibility greatly impaired.

Q. What are the symptoms during the *hot* and *sweating* stages of intermittent fever?

A. The *hot stage* commences with an increase of heat, redness of the face, a dry skin, thirst, pain of the head, throbbing of the temples, anxiety and restlessness; the tongue is furred, the pulse, in general, regular, hard and full, and the respiration, though still frequent, is fuller and more regular than during the cold stage. These symptoms having continued for some time, a moisture breaks out upon the forehead, which is soon followed by a universal sweat; the heat of the body abates, the thirst goes off, the urine deposits a sediment. All the functions are restored to their ordinary state, but the patient continues in a debilitated and wearied condition.

Q. What is the mode of treating intermittent fever?

A. This varies according to the different stages of the disease. In general we should endeavour to prevent the accession of the paroxysm, by administering, a short time before the cold stage is expected to commence, an emetic, and following it up by the pediluvium, and a dose of tinctura opii, given in some warm beverage. If the cold stage comes on, the patient is to be put to bed, covered up warm, and a perspiration solicited by the free administration of some slightly aromatic infusion,

given warm. During the hot stage, the physician should moderate febrile symptoms by bleeding, if necessary, saline purgatives, antimonials, blisters, &c. and, during the intermission of the disease, endeavour to prevent its recurrence, by the copious administration of the Peruvian bark; preceding its use by proper evacuations. The Fowler's solution of arsenic has been found of great service in the cure of this disease; it may be administered to an adult in the dose of from ten to twenty drops three times a day.

Q. What is an epistaxis?

A. It is a bleeding from the nose, generally attended with pain, and fulness of the head, and some febrile symptoms.

Q. What are the leading symptoms of measles?

A. They are fever, generally of an inflammatory type; attended with a hoarseness, cough, and other catarrhal symptoms; about the fourth day of the disease, an eruption of small red spots, which are perceptible to the touch, break out over the whole body, and, after a continuation of a few days, go off in a desquamation of the cuticle.

Q. What is the general plan of treatment in inflammatory eruptive diseases?

A. By bleeding and purging, carried to such an extent as the symptoms shall warrant; the use of the antimonial powders, blisters, and a strict adherence to the antiphlogistic regimen.

Q. What is the definition of a dropsy?

A. It is a disease in which there is a preternatural collection of a serous fluid in the cellular membrane, or some one of the great cavities of the body.

Q. What are the leading symptoms of cynanche tonsillaris?

A. They are fever, attended with an acute pain in the throat, sometimes darting into the ears; there are a redness and swelling in the tonsils, palate, and fauces, and an increase of pain and difficulty in deglutition.

Q. What are the general outlines of the treatment of cynanche tonsillaris?

A. Early venesection, both general and local, saline purges, the antimonial powders, blisters to the throat,

and gargles of borax or nitre dissolved in vinegar or water, and a strict attention to diet and regimen.

Q. What is meant by a remittent fever?

A. By a remittent fever is meant a fever attended with exacerbations and remissions, but in which there is no perfect intermission of the symptoms.

Q. What are the leading symptoms of acute hepatitis?

A. A pain more or less acute in the right hypochondrium, increased by pressure on the part, and frequently extending to the top of the right shoulder; there is a difficulty of respiration, a dry cough, uneasiness on lying on the affected side, considerable fever, and a frequent, strong, and hard pulse.

Q. How many species of hepatitis are there?

A. There are two, an acute and chronic.

Q. How may hepatitis be distinguished from spasm on the gall ducts?

A. By the absence of nausea, by the permanency of the pain, by the frequency of the pulse, and by the patient preferring a straight position of his body; whereas, in case of spasm of the gall ducts, he finds the most easy posture is with his body bent forward on his knees.

Q. What is the treatment of acute hepatitis.

A. Copious and repeated bleedings, both general and local, at an early period of the disease, purging by means of calomel, blisters to the region of the liver, the antimonial powders, and the antiphlogistic regimen. If the disease should not give way after these remedies have been fully employed for several days, a slight salivation should be induced, and kept up for some time.

Q. What is the treatment proper in chronic hepatitis?

A. In the treatment of chronic hepatitis, mercury is generally resorted to; the bowels are at the same time to be kept open by the use of laxatives. If there be any local uneasiness, blisters will be proper. The patient should wear flannel next his skin; make use of such food as is easy of digestion, and should carefully shun late hours, and the night air.

Q. What are the symptoms of icterus, or jaundice?

A. Yellowness of the skin, but more particularly of the adnata of the eye, a bitter taste in the mouth, sickness of stomach, loathing of food, flatulency, a sense of pain or uneasiness in the right hypochondrium, whitish or clay-coloured fæces, the urine being of an obscure red,and tinging articles dipped into it of a deep yellow.

Q. What is meant by hectic fever?

A. It is a fever occurring from local irritation in a debilitated habit, and is attended with a frequent, small pulse, loss of appetite, nausea, a moisture of the skin, a circumscribed redness of the cheeks, a copious flow of urine, a clean moist tongue, night sweats, watchfulness, diarrhœa, great emaciation, and throughout its course by frequent chills, succeeded by flushes of heat.

Q. Does it arise from an absorption of pus, as some have supposed?

A. No; this is proved by the fact, that hectic fever may exist in cases where no pus exists, as it does in the disease of the knee joint, previous to suppuration; and that frequently a large collection of matter is absorbed, without inducing hectic, as we see in buboes, &c.

Q. How is hectic to be distinguished from intermittent fever, to which it bears some resemblance?

A. By the irregularity of its paroxysms; by the appetite for food not being so much impaired as in intermittent fever; by the tongue being moist and free from fur, and by the circumscribed redness of the cheeks in the hectic.

Q. What are the general symptoms of cynanche trachealis?

A. They are great difficulty of breathing, attended with a peculiar wheezing, hoarse inspiration; there is a loud, shrill, ringing cough, and fever. The acute stage of the disease, if not arrested by art, generally terminates in the exudation of a layer of coagulable lymph on the lining membrane of the trachea, &c.

Q. What are the outlines of the treatment proper in a case of cynanche trachealis?

A. The treatment should be commenced by prompt and copious bleeding, and the administration of an active emetic, followed immediately by immersion in the warm bath—the patient is now to be put to bed, and a dose of calomel is to be administered, and repeated un-

til copious evacuations from the bowels are procured—if the force of the disease be not now considerably abated, the bleeding should be repeated, or leeches applied to the throat followed by a blister. The bleeding and emetic are to be repeated as often as demanded by the symptoms. After the more violent symptoms have abated, the antimonials and expectorants have been found beneficial.

Q. What are the leading symptoms of scarlatina?

A. There is fever, and, in general, a soreness and swelling of the fauces and throat, and a bright scarlet eruption pervades the whole body, including the face and limbs, which, after three days' continuance, goes off in a desquamation of the cuticle.

Q. How may scarlatina be distinguished from the measles?

A. By the eruption in scarlatina appearing on the second day of the disease, in the measles not until the fourth; by the difference of the colour of the eruption in the two diseases, it being of a bright scarlet in scarlatina, in the measles of a dark raspberry colour; by the skin feeling rough in the measles, owing to the elevation of the eruptions, but smooth in scarlatina; lastly, by there being little or no catarrhal symptoms present in the scarlet fever.

Q. What are the symptoms of pertussis, or whooping cough?

A. The disease commences with slight febrile symptoms, succeeded by hoarseness, cough, and difficulty of expectoration. After these symptoms have continued for perhaps a fortnight, the cough becomes convulsive, interrupted by a full and sonorous inspiration, after which the cough is again renewed, and continues until vomiting or copious expectoration comes on, when the fit terminates; these fits of coughing are renewed at irregular intervals during the continuance of the disease. During the fits of coughing, blood is sometimes discharged from the mouth and nostrils.

Q. What is a dysentery?

A. It is a febrile disease, attended with severe griping pains in the bowels; a frequent desire to evacuate the intestines, without the ability, on going to stool, of

passing any thing but a little mucus, frequently streaked with blood. The fæces, when they are evacuated, appearing in the form of hard balls, denominated scyballæ.

Q. How may dysentery be distinguished from diarrhœa?

A. By the absence of pain, fever, and tenesmus in the latter, and by the discharge from the bowels being fœcal.

Q. What are the outlines of the treatment of dysentery?

A. Bleeding at short intervals, proportioned to the degree of inflammation, as indicated by the pain and fever, followed by cathartics, which operate freely, without occasioning much griping. These should be continued until the stools assume a natural appearance. After the force of the disease is somewhat reduced, the antimonial powders should be administered, and a large blister applied to the abdomen. If the symptoms do not speedily yield, mercury is to be employed, so as to induce a salivation. After the inflammatory symptoms have been subdued, and nothing remains but a looseness and tenesmus, opium will be proper, either in injections, or by the mouth. The tone of the intestines are to be restored by the use of tonics, blisters, the cold bath, exercise, &c.

Q. What is meant by tenesmus?

A. An inordinate desire to go to stool, without the power of evacuating the intestines.

Q. How is colic to be distinguished from enteritis?

A. By the pain in the former being fixed and constant, and increased upon pressure; whereas in the latter, the pain is at intervals, and of a peculiar twisting nature, alleviated by pressure, and accompanied by an irregular contraction of the abdominal muscles.

Q. What are the symptoms of pleurisy?

A. Fever; pain in the thorax, increased upon a full inspiration, and by coughing; difficulty of respiration; a cough, at first dry, but afterwards accompanied by an expectoration; a difficulty of lying on the affected side, and a full, frequent, and hard pulse.

Q. How is pleurisy to be treated?

A. By very copious bleeding, from a large orifice, repeated at short intervals, until the pain and difficulty of breathing are subdued; by blisters to the affected side, and by the antimonial powders; the bowels are to be kept open, and the patient confined to a strict antiphlogistic regimen; the cough should be relieved by some demulcent mixture.

Q. When gangrene takes place in an internal part, what are the symptoms?

A. Sudden cessation of pain, a peculiar appearance of the countenance, cold perspiration, coldness of the extremities, hiccup, subsultus tendinum, suppression of urine, convulsions, and a scarcely perceptible pulse.

Q. What is meant by diabetes?

A. It is a disease attended with a frequent and very copious discharge of urine, which is generally of a saccharine nature; and a voracious appetite.

Q. How many species of diabetes are there?

A. There are two; viz. diabetes mellitis, and diabetes insipidus; in the one the urine discharged being saccharine, in the other not.

Q. How may gout be distinguished from rheumatism?

A. By the pains in gout being preceded by some disorder of the stomach, which is not the case in rheumatism; by the pains in the gout affecting the lesser joints, particularly of the extremities, whereas, in the rheumatism, the larger joints are their seat; and in the gout the affected parts are redder, and more swollen than in rheumatism.

Q. What are the outlines of the treatment of active hæmorrhages?

A. Active hæmorrhages are to be treated by bleeding and purging, and the antiphlogistic plan generally; by the local application of cold, and the administration of certain remedies, as common salt in substance, sugar of lead, alum, digitalis, and opium.

Q. What is meant by pyrosis?

A. It is the discharge of a glairy fluid from the stomach by eructation, with a sense of burning in the epigastric region, and dyspepsia.

Q. What is the mode of treating rheumatism?

A. In *acute rheumatism*, the symptoms of general inflammation are to be obviated by the abstraction of blood from the arm, the extent and repetition of the depletion being directed by the effects produced upon the disease: in conjunction with the use of the lancet, the saline cathartics, antimonials, &c. are to be administered, and the patient confined to a strictly antiphlogistic regimen. The remedies for the local symptoms are leeches, or cups, blisters, cold applications, &c. After proper depletion, the remedy which appears best adapted to the disease is the pulvus ipecacuanhæ compositus, frequently repeated. Where the depleting remedies have been carried as far as deemed prudent, and the disease still continues, great advantage has been derived from calomel in small doses, combined with opium.—In *chronic rheumatism*, the principal remedies are local bleeding, stimulant rubefacients, friction with a flesh brush, sudorifics, tonics, and a proper regulation of diet and exercise.

Q. What are the symptoms of hæmoptysis?

A. There is, in general, a pain, or a sense of uneasiness in some part of the thorax; difficulty of breathing; a saltish taste in the mouth, succeeded by a discharge of blood from the lungs, of a florid colour, and often frothy, brought up with more or less hawking.

Q. How many species of worms infest the human intestines?

A. Three round; viz. the lumbricoides, ascarides, and trichures: and two flat, viz. the tenia and cucurbitinæ.

Q. How may an incisted abdominal dropsy be distinguished from ascites?

A. If the general system appear to be little affected; if the patient's strength and appetite be not much impaired, and the sleep be but little interrupted; if the tumor of the abdomen was at first confined to one particular part; if the menses in the female continue to flow as usual; if there be no anasarca, or if it is confined to the extremities, and there is no leucophlematic paleness, or sallow colour of the face; if there be no fever, nor much scarcity of urine, there will be reason to suspect the disease to be of the incisted kind.

Q. How many kinds of catarrh are there?

A. Two; viz. catarrhus à frigore, and catarrhus epidemicus, or the influenza.

Q. What is meant by scrofula?

A. It is a peculiar affection of the lymphatic system, attended with an enlargement of the conglobate glands, which runs on to an imperfect suppuration; it affects persons of peculiar habits, and is hereditary.

Q. What are the indications of cure in catarrh?

A. To reduce febrile action by the usual remedies, and to allay the irritation of the affected parts by demulcent mixtures.

Q. What are the leading symptoms of apoplexy?

A. They are a sudden loss of sense and voluntary motion, the action of the heart and arteries still continuing, with a stertorous breathing, and a turgid and flushed countenance.

Q. What is the mode of treating apoplexy?

A. After removing all ligatures from about the neck, and placing the patient in an erect posture, he is to be bled copiously, both from the arm, and by cups from the temples and occiput; if the patient can swallow, an active purge should be administered; if not, a strong clyster. Sinapisms should be applied to the extremities; the head is to be shaved, and cold applied to it; and, after sufficient evacuation, a large blister.

Q. How may hæmoptysis be distinguished from hæmetemesis?

A. By the blood in the latter disease, in place of being in small quantities, of a florid red colour, mixed with a little frothy mucus, and brought up by coughing, as in hæmoptysis, being thrown up by vomiting, in large quantities, of a dark colour, and mixed with the contents of the stomach, and unattended with cough.

Q. How many species of colic are there?

A. There are three; the bilious, the flatulent, and the colica pictonum.

Q. What is the general mode of treating the colica pictonum?

A. By bleeding, according to circumstances; by the administration of purges, and by the use of mercury, so

as to excite a salivation; by warm fomentations to the abdomen, and afterwards a blister.

Q. How can acute be distinguished from chronic rheumatism?

A. While the pains are unfixed, readily changing their place; when they are greater in the night time; when, at the same time, they are attended with fever, and with pain and redness of the joints, the disease is to be considered as acute. But when there is little or no fever remaining; when the affected joints are without redness, and are cold and stiff; when, while a free sweat is excited on the rest of the system, the affected joints are only cold and clammy, and especially when the pains are increased by cold and relieved by heat, the case is to be considered as purely chronic.

Q. What do you mean by an anasarca?

A. A dropsy, or morbid collection of water in the cellular membrane of the whole, or a part of the body.

Q. What are the leading symptoms of hydrocephalus?

A. They are languor, inactivity, loss of appetite, nausea, vomiting, obstinate costiveness, parched tongue, dry skin, and other febrile symptoms; violent and continued pain in the head, particularly across the brow, stupor, suffused redness of the eyes, great sensibility, and aversion to light, suddenly interrupted sleep, with violent screaming, convulsions, and dilated pupils.

Q. What are the outlines of the treatment of hydrocephalus?

A. In the first stage, it is to be treated by prompt and efficient depletion; by bleeding, both general and local, purging with calomel, followed by a solution of salts, by blisters, &c. After effusion has taken place, mercury should be exhibited in such a manner as to induce a speedy salivation.

Q. What are the general symptoms of gastritis and enteritis?

A. They are, fever, a constant acute pain in some part of the abdomen, increased by pressure on the part, nausea, vomiting, obstinate costiveness, and a small, frequent, and contracted pulse.

Q. What are the outlines of the treatment of gastritis and enteritis?

A. Copious and early bleeding, repeated at short intervals, as long as the symptoms continue with little abatement, followed by local bleeding from the abdomen, and afterwards the application of a large blister to the part; after the nausea and vomiting are somewhat abated, we may resort to purgatives, in order to remove the costiveness. The patient should, at the same time, be confined to a strict antiphlogistic regimen.

Q. What is meant by an antiphlogistic regimen?

A. The antiphlogistic regimen consists in avoiding, as much as possible, 1st, all impressions on the external senses, such as heat, light, noise, &c.; 2d. all motion of the body; the patient should therefore be placed in that position which puts in action fewest of the muscles, and he is to be debarred from talking; 3d, all exercise of the mind; 4th, all kinds of food and drink, excepting such as are of the mildest and least stimulating kind, such as toast and water, rice water, barley water, apple water, &c. and, even of these, but a small quantity should be allowed.

Q. How may typhus be distinguished from a fever of an inflammatory type?

A. By the more sudden accession of the latter disease; by its arising from sudden alterations of temperature, the application of cold to the body when heated, violent exercise, intemperance, &c. and not from contagion; by the strength of the body not being so much diminished, and by the hardness of the pulse, the whiteness of the tongue, and the high colour of the urine.

Q. Describe the progress of the arm after vaccination.

A. About the third day after the insertion of the virus, the puncture becomes inflamed, and feels hard to the touch; on the next day the red point is a little increased in size, and somewhat radiated; between the fifth and sixth days there is a small circular or slightly oval vesicle, of a dull pearl white colour, containing a

limpid fluid, acquiring, about the tenth day, a diameter equal to about the third or fourth of an inch; until the end of the eighth day its surface is even, being depressed in the centre, but on the ninth day it becomes flat, or sometimes rather higher in the middle than at the edges, the margins are turgid and round, and project a little over the base of the vesicle; on the eighth or ninth day the vesicle is surrounded by an areola of an intensely red colour, and the parts covered by it are tumid and hard; on the eleventh or twelfth day, as the areola decreases, the surface of the vesicle becomes brown at the centre, and is not so clear at the margin, the cuticle gives way, and there remains a firm and glossy mahogany-coloured scab, which is not detached in general until the twentieth day.

Q. What are the general symptoms of epilepsy?

A. A sudden deprivation of the senses of the patient, accompanied with violent convulsions of the whole body; these after a time go off, leaving the patient, in general, in his usual state, but sometimes a considerable degree of stupor and weakness remains behind, particularly when the disease has been of frequent occurrence.

Q. What is meant by ascites?

A. It is a morbid collection of water in the cavity of the abdomen.

Q. What are the general symptoms of hydrothorax, or dropsy of the chest?

A. They are, anxiety at the lower end of the sternum, succeeded by a difficulty of respiration, particularly on motion, or when in a horizontal posture; difficulty of lying on the side opposite to that in which the effusion exists; sudden starting from sleep, with anxiety, a sense of suffocation, and palpitation; irregularity of the pulse, cough, occasionally syncope, œdematous swelling, thirst, and a diminution of urine, which is high coloured, and deposits, on cooling, a reddish sediment. The most decisive symptom is a sensation of a fluctuating fluid being experienced in the chest on certain motions of the body.

Q. How is tympanites distinguished from ascites?

A. By the absence of fluctuation, and of those symptoms which characterize the hydroptic diathesis.

Q. What do you mean by leucorrhœa?

A. A disease consisting in a discharge of thin, white, or yellow matter, from the uterus and vagina, frequently attended with pains in the back, smarting in passing the urine, anorexia, emaciation, &c. Sometimes the discharge is fœtid, and produces excoriation of the parts.

Q. How may leucorrhœa be distinguished from gonorrhœa?

A. Leucorrhœa is unaccompanied with inflammation of the parts, and the discharge is very irregular, coming away sometimes in large lumps and in considerable quantity; whereas, in gonorrhœa, there is much inflammation and general irritation, ardor urinæ, swelling of the labia, or of the glands of the groin, and the discharge is constant, but small in quantity.

Q. When arsenic has been taken by mistake, or for the purpose of poisoning, what are the symptoms produced?

A. A burning and pricking sensation in the stomach, excruciating pains in the bowels, unquenchable thirst, excessive vomiting, dry and rough tongue and throat, great anxiety and uneasiness, inflammation of the stomach and intestines, followed by distension of the abdomen, coldness of the extremities, hiccup, gangrene, fœtid stools, vomiting, and death.

Q. How is *epilepsy* distinguished from *apoplexy?*

A. By the increase of the voluntary motions in epilepsy, and their complete suspension in apoplexy, and by the stertorous breathing in the latter.

Q. How may *pneumonia* be distinguished from *hepatitis?*

A. Pressure in pneumonia does not increase the pain; in inflammation of the liver it does; in pneumonia the patient cannot lie on the side affected; in hepatitis the pain is considerably increased by lying on the opposite one.

I wish I was safe thro
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APPENDIX.

CONTAINING,

I.

A TABLE OF THE ARTICLES OF THE MATERIA MEDICA, THEIR QUALITIES AND DOSES.

II.

CHEMICAL DECOMPOSITIONS, WHICH TAKE PLACE IN THE FORMATION OF VARIOUS PHARMACEUTICAL PREPARATIONS.

III.

ANTIDOTES IN CASES OF POISONS.

IV.

A TABLE OF SALTS WHICH MUTUALLY DECOMPOSE EACH OTHER.

The following list of the Materia is according to the last edition of the Pharmacopæia Londinensis.

MATERIA MEDICA.

In the second column, *Vegetables* are arranged according to Wildenow's Edition of the *Species plantarum of Linnæus; Animals* according to Gmelin's Edition of the *Systema Naturæ of Linnæus*, and *Chemical Articles* are designated by the most modern names, unless it be otherwise specified.

ABIETES Resina	Pinus Abies	*Resin of the Spruce Fir.*	Stimulant	Externally
Absinthium	*Artemisia* Absinthium	*Common Wormwood*	Tonic, anthelmintic	℈i to ʒi.
Acaciæ Gummi	Acacia vera	*Acacia Gum*	Demulcent	ʒss. to ℥i.
Acetosæ Folia	Rumex Acetosa	*Leaves of Sorrel*	Refrigerant, diuretic	*Ad libitum*
Acetosella	Oxalis Acetosella	*Woodsorrel*	Refrigerant, anti-scorbutic	*Ad libitum*
Acetum	.....	*Vinegar*	Antinarcotic, refrigerant	fʒi. to fʒss.
Acidum Aceticum fortius	Acidum aceticum è ligno distillatum	*Strong acetic acid*	.....	.....
Acidum Citricum Crystalli	.....	*Citric acid. The Crystals*	.....	.....
Acidum sulphuricum	.....	*Sulphuric Acid*	*when diluted* Tonic	.....

Aconiti Folia	Aconitum Napellus	*Aconite or Leaves of Monk's Hood*	Narcotic, sudorific	gr. i. to v.
Adeps	Sus Scrofa	*Hog's Lard*	.....	.....
Ærugo	Subacetas Cupri impura	*Verdigris*	Tonic Emetic	gr. 1-8 to gr. ½ gr. i.
Allii Radix	Allium sativum	*Root of Garlic*	Diuretic, expectorant, stimulant	gr. x. to ʒi.
Alöes spicatæ Extractum	Alöe spicata	*Extract of spiked Alöes*	Stimulating cathartic, anthelmintic	gr. v. to xv.
Althææ Folia et Radix	Althæa officinalis	*Leaves and root of Marshmallows*	Emollient, demulcent	See Syrup:
Alumen	Supersulphas Aluminæ et Potassæ	*Alum*	Astringent, tonic	gr. v. to ℈i.
Ammoniacum	Heracleum Gummiferum	*Ammoniac*	Expectorant, antispasmodic	gr. x. to ʒss.
Ammoniæ Murias	Murias Ammoniæ	*Muriate of Ammonia*	Diuretic, aperient	gr. x. to ʒss.
Amygdalæ amaræ	Amygdalus communis Var γ	*Bitter Almonds*	Narcotic, demulcent	.....
Amygdalæ dulces	Var β	*Sweet Almonds*	Demulcent	vide Mist. Amygd.
Amylum	Triticum hybernum	*Starch*		
Anethi Semina	Anethum graveolens	*Dill Seeds*	Carminative	gr. x. to ʒi.
Anisi Semina	Pimpinella Anisum	*Anise Seeds*	Carminative, stimulant	gr. x. to ʒi.

Anthemidis Flores	Anthemis nobilis	*Flowers of Chamomile*	Tonic, stomachic	gr. x. to dr. i.
Antimonii Sulphuretum	Sulphuretum Antimonii	*Sulphuret of Antimony*	Alterative, diaphoretic	.....
Antimonii vitrum	Antimonii oxydum sulphuratum vitrefactum	.....	.....	.....
Argentum	Argentum purificatum	*Silver*	.....	.....
Armoraciæ Radix	Cochlearia Armoracia	*Root of Horseradish*	Antiscorbutic, stimulant, diuretic	scr. i. to dr. i.
Arsenicum Album	Acidum Arseniosum	*Oxide of Arsenic*	Preparations	
Asari Folia	Asarum Europæum	*Leaves of Asarabacca*	Emetic, cathartic	used as an errhine
Assafœtidæ Gummi-Resina	Ferula Assafœtida	*Gum Resin of Assafœtida*	Antispasmodic, stimulant, expectorant	gr. v. to dr. ss.
Avenæ Semina	Avena sativa	*Oats*	Nutritive, emollient	*ad libitum*
Aurantii Baccæ	Citrus Aurantium	*Seville Oranges*	Refrigerant	*ad libitum*
Aurantii Cortex	*The outer Rind of the Fruit*	*Orange Rind*	Tonic, stomachic	vide Tinct.
BALSAMUM Peruvianum	Myroxylon Peruiferum	*Peruvian Balsam*	Stimulant, expectorant	gr. v. to dr. ss.

Balsamum Tolutanum	Toluifera Balsamum	*Balsam of Tolu*	Expectorant, stimulant	gr. x. to dr. ss.
Belladonnæ Folia	Atropa Belladonna	*Leaves of the Deadly Nightshade*	Narcotic, antispasmodic, diaphoretic	gr. ss. to gr. iv. gradually.
Benzöinum	Styrax Benzöin	*Benzöin*	Expectorant, stimulant	gr. x. to dr. ss.
Bismuthum	.....	.....	vide subnitrate of Bismuth	.....
Bistortæ Radix	Polygonum Bistorta	*Bistort Root*	Astringent	gr. x. to dr. ss.
CAJUPUTI Oleum	Melaleuca Cajuputi	*Cajuput Oil*	Stimulant, antispasmodic, diaphoretic	min. i. to min. v.
Calamina	Carbonas Zinci impura	*Calamine*	.....	.....
Calami Radix	Acorus Calamus	*Root of the Sweet Flag*	Stimulant, stomachic	gr. x. to dr. i.
Calumba	Cocculus Palmatus *De Candolle, Sys. Nat.*	*Calumba*	Tonic, stomachic	gr. x. to dr. i.
Cambogia	Stalagmitis Cambogiöides	*Camboge*	Cathartic, hydragogue	gr. ii. to xii.
Camphora	Laurus Camphora	*Camphor*	Sudorific, antispasmodic, sedative	gr. iii. to scr. i.

Canellæ Cortex	Canella alba	*Canella Bark*	Cordial, aromatic	gr. x. to dr. ss.
Cantharis	Cantharis Vesicatoria *Latreille, Gen. Insect.*	*Spanish Fly*	Diuretic, stimulant	gr. ¼ to gr. iii.
Capsici Baccæ	Capsicum annuum	*Berries of Capsicum*	Stomachic, stimulant	gr. v. to x.
Carbo Ligni	Carbo Ligni recens	*Charcoal*	Antiseptic	gr. v. to scr. i.
Cardamines Flores	Cardamine pratensis	*Cuckoo-flower*	Stimulant, antispasmodic	scr. i. to dr. i.
Cardamomi Semina	Matonia Cardamomum *Smith, in Rees Cyclop.*	*Seeds of Cardamom*	Stomachic, carminative, stimulant	gr. v. to dr. ss.
Caricæ Fructus	Ficus Carica	*Figs*	.....	.....
Carui Semina	Carum Carui	*Carraway Seeds*	Carminative	gr. x. to dr. i.
Caryophylli	Eugenia caryophyllata	*Cloves*	Aromatic, stimulant	gr. v. to scr. i.
Caryophyllorum Oleum	*Their essential Oil*	*Oil of Cloves*	Stimulant, aromatic	min. i. to min. v.
Cascarillæ Cortex	Croton Cascarilla	*Cascarilla Bark*	Tonic, stomachic	gr. x. to dr. i.
Cassiæ Pulpa	Cassia Fistula	*Cassia Pulp*	Laxative	oz. ss. to oz. i.
Castoreum	Castor Fiber (Rossicus)	*Castor*	Antispasmodic	gr. v. to scr. i.
Catechu Extractum	Acacia Catechu	*Extract of Catechu*	Astringent	gr. x. to scr. i.

Centaurii Cacumina	Chironia Centaurium	*Tops of Centaury*	Tonic, Stomachic	gr. x. to dr. i.
Cera alba	.....	*White Wax*	.....	.....
Cera flava	.....	*Yellow Wax*	.....	.....
Cerevisiæ fermentum	.....	*Yeast*	.....	.....
Cetaceum	Physeter macrocephalus	*Spermaceti*	Demulcent, emollient	scr. i. to dr. ii.
Cinchonæ cordifoliæ Cortex	Cinchona cordifolia *Zea, in Anal. de Hist. Nat.*	*Bark of heart-leaved Cinchona, (yellow bark)*	Tonic, febrifuge, astringent, stomachic	gr. x. to dr. ii.
Cinchona lancifoliæ Cortex	Cinchona lancifolia	*Bark of lance-leaved Cinchona, (or pale bark)*	The same	gr. x. to dr. ii.
Cinchonæ oblongifoliæ Cortex	Cinchona oblongifolia	*Bark of oblong-leaved Cinchona, (or red bark)*	The same	gr. x. to dr. ii.
Cinnamomi Cortex	Laurus Cinnamomum	*Cinnamon Bark*	Aromatic, astringent, stimulant	gr. v. to scr. i.
Cinnamomi Oleum	*Its essential Oil*	*Oil of Cinnamon*	Stimulant, stomachic	min. i. to min. iii.
Coccus	Coccus Cacti	*Cochineal*	.....	.....
Colchici Radix et semina	Colchicum Autumnale	*Seeds and Root of Meadow Saffron*	Diuretic, narcotic, cathartic	gr. i. to gr. v.

Colocynthidis Pulpa	Cucumis Colocynthis	*Pulp of the Bitter Apple*	Cathartic	gr. i. to gr. v.
Conii Folia et semina	Conium maculatum	*Seeds and leaves of Hemlock*	Narcotic	gr. ii. to scr. i.
Contrajervæ Radix	Dorstenia Contrajerva	*Contrajerva Root*	Tonic, diaphoretic, stimulant	gr. x. to dr. ss.
Copaiba	Copaifera officinalis	*Copaiba*	Diuretic, stimulant	min. xx. to dr. i.
Coriandri Semina	Coriandrum Sativum	*Coriander Seeds*	Carminative	scr. i. to dr. iss.
Cornua	Cervus Elaphus	*Horns (of the Stag)*		.....
Creta	Carbonas Calcis fri-abilis	*Chalk*	Antacid.	
Croci Stigmata	Crocus Sativus (Anglicus)	*The stigmata of Saffron*	Cordial, diaphoretic	gr. v. to dr. ss.
Cubeba	Piper Cubeba	*Cubebs*	*In Gonorrhœas*	dr. i. to dr. iii.
Cumini Semina	Cuminum Cyminum	*Cumin Seeds*	Stimulant, antispasmodic	scr. i. to dr. i.
Cupri Sulphas	Sulphas Cupri	*Sulphate of Copper*	Tonic, astringent, emetic	gr. $\frac{1}{4}$ to gr. i. gr. iii. to gr. x.
Cuspariæ Cortex	Cusparia Febrifuga *Bonpland Voy.*	*Cusparia Bark*	Tonic, stomachic	gr. v. to scr. i.
Cydoniæ Semina	Pyrus Cydonia	*Quince Seeds*	*Dec : Cydon.*	

DAUCI Radix	Daucus Carota	*Carrot Root*	.....	.....
Dauci Semina	Daucus Carota (agrestis)	*Wild Carrot Seeds*	Diuretic, stimulant	scr. i. to dr. i.
Digitalis Folia et Semina	Digitalis Purpurea	*Leaves and seeds of Digitalis*	Narcotic, diuretic, sedative	gr. ss. to gr. iii.
Dolichi Pubes	Dolichos pruriens	*Cowhage*	Anthelmintic	gr. v. to gr. x.
Dulcamaræ Caulis	Solanum Dulcamara	*Stalk of Bittersweet, or Woody Nightshade*	Diuretic, diaphoretic	vide Decoct.
ELATERII Pepones	Momordica Elaterium	*Fruit of the wild cucumber*	Violently cathartic	gr. i. to gr. ss. vide Extract
Elemi	Amyris Elemifera	*Elemi*		gr. x. to dr. ss.
Euphorbiæ Gummiresina	Euphorbia officinarum	*The Gum-resin of Euphorbium*	Used as an Errhine	.....
FARINA	Triticum Hybernum	*Flour*	.....	.....
Ferrum	Ferri Ramenta et Fila	*Iron*	Tonic, anthelmintic	gr. v. to gr. xx.
Filicis Radix	Aspidium Filix mas *Smith, Flor. Brit.*	*Root of the Male Fern*	Anthelmintic	dr. i. to dr. iii.

Fœniculi semina	Anethum Fœniculum	*Seeds of Fennel*	Stimulant, carminative, diuretic	scr. i. to dr. i.
Fucus	Fucus vesiculosus	*Sea-wrack, or Bladder Fucus*	Burnt and powdered) deobstruent	scr. i. to dr. i.
GALBANI Gummiresina	Bubon Galbanum	*Gum-resin of Galbanum*	Antispasmodic, expectorant	gr. x. to dr. i.
Gallæ	Cynips Quercûs folii	*Gall-nut*	Astringent, tonic	gr. x. to scr. i.
Gentianæ Radix	Gentiana Lutea	*Root of Gentian*	Tonic, stomachic	gr. x. to dr. i.
Glycyrrhizæ Radix	Glycyrrhiza glabra	*Root of Liquorice*	Demulcent	dr. ss. to dr. i.
Granati Cortex	Punica Granatum	*Bark of the Pomegranate*	Astringent	scr. i. dr. i.
Guaiaci Resina et Lignum	Guaiacum officinale	*Resin and Wood of Guaiacum*	Sudorific, stimulant, or purgative	gr. v. to dr. ss. gr. xv. to scr. ii.
HÆMATOXYLI Lignum	Hæmatoxylon Campechianum	*Logwood*	Astringent, tonic	scr. i. to dr. i.
Helenium	Inula Helenium	*Elecampane*		
Hellebori fœtidi folia	Helleborus fœtidus	*Leaves of stinking Hellebore*	Cathartic, anthelmintic	gr. x. to dr. ss.
Hellebori nigri radix	Helleborus niger			
Hordei Semina	Hordeum distichon	*Pearl Barley*	In *Dec.*	.....

Humuli Strobili	Humulus Lupulus	*Hops*	Anodyne, diuretic	gr. x. to scr. i.
Hydrargyrum	.....	*Quicksilver*	.....	.....
Hyoscyami Folia et Semina	Hyoscyamus niger	*Henbane Leaves and Seeds*	Narcotic, diaphoretic	gr. ii. to gr. x.
JALAPÆ Radix	Convolvulus Jalapa	*Root of Jalap*	Cathartic	gr. x. to dr. ss.
Ipecacuanhæ Radix	Collicocca Ipecacuanha Brotero, *in Act. Soc. Linn.*	*Root of Ipecacuanha*	Diaphoretic, expectorant, emetic	gr. ss. to gr. ii. et gr. v. to dr. ss.
Juniperi Baccæ et Cacumina	Juniperus communis	*Tops and Berries of Juniper*	Diuretic, stimulant, carminative	dr. ss. to dr. i.
KINO	Pterocarpus Erinacea *Encycl. Method.*	*Kino*	Astringent	gr. x. to gr. xx.
Krameriæ Radix	Krameria triandria *Flor. Peruv.*	*Rhatany Root*	Astringent	scr. i. to scr. ii.
LACTUCA	Lactuca Sativa	*Lettuce*	Extract, narcotic	
Lavandulæ Flores	Lavandula Spica	*Flowers of Lavender*	Stimulant, aromatic	scr. i. to dr. i.
Lauri Baccæ et Folia	Laurus Nobilis	*Berries and Leaves of the Bay tree*	Stimulant, narcotic	gr. x. to dr. ss.

Lichen	Lichen islandicus	*Liverwort*	Tonic, demulcent	scr. i. to dr. i.
Limones	Citrus Medica	*Lemons*	Refrigerant, anti-scorbutic	f oz. ii.
Limonum Cortex	*Their exterior rind*	*Rind of Lemons*	Stomachic, stimulant	.....
Limonum Oleum	*The essential Oil of the outer rind*	*Oil of Lemons*		.....
Linum Catharticum	Linum catharticum	*Purging Flax*	Cathartic	scr. i. to dr. i.
Lini usitatissimi semina	Linum usitatissimum	*Common Linseed*	Demulcent	*ad libitum*
MAGNESIÆ subcarbonas	Subcarbonas Magnesiæ purificata	*Subcarbonate of Magnesia*	Antacid, laxative	dr. ss. to dr. i.
Magnesiæ Sulphas	.....	*Sulphate of Magnesia*	Cathartic	dr. ii. to oz. i.
Malva	Malva sylvestris	*Common Mallow*	Demulcent	dr. ss. to dr. i.
Manna	Fraxinus Ornus	*Manna*	Laxative	oz. ss. to oz. ii.
Marmor Album	Carbonas calcis dura	*White Marble*		
Marrubium	Marrubium vulgare	—— *Horehound*	Emmenagogue, cathartic	gr. xv. to scr. ii.
Mastiche	Pistacia Lentiscus	*Mastich*	Stimulant, sialagogue	gr. x. to dr. ss.
Mel	.....	*Honey*	.....	.....
Mentha piperita	{ Mentha piperita	*Peppermint*	Stomachic, stimulant	gr. x. to dr. i.
	{ Mentha viridis *Smith in Ac. So. Lin.*	*Spearmint*	Stomachic, stimulant	gr. x. to dr. i.

Menyanthes	Menyanthes trifoliata	*Buckbean*	Cathartic, tonic	dr. ss. to dr. i.
Mezerei Cortex	Daphne Mezereum	*Bark of Mezereon*	Stimulant, deobstruent, diaphoretic	gr. i. to gr. x.
Mori Baccæ	Morus nigra	*Mulberries*	Cooling, laxative	.....
Moschus	Moschus moschiferus	*Musk*	Stimulant, antispasmodic	gr. ii. to scr. i.
Myristicæ Nuclei	Myristica moschata	*Nutmegs*	Aromatic, stimulant	gr. v. to scr. i.
Myrrha	*The Gum-resin of a tree not yet described*	*Myrrh*	Stimulant, expectorant	gr. x. to dr. i.
OLIBANUM	Juniperus Lycia	*Olibanum*	Stimulant	gr. x. to dr. ss.
Olivæ Oleum	Olea Europæa	*Oil of Olive*	Demulcent, emollient	f dr. ss. to f oz. i.
Opium	Papaver somniferum	*Opium*	Narcotic, anodyne, sedative	gr. i. to gr. v.
			Stimulant	gr. $\frac{1}{4}$ to gr. ss.
Opoponacis Gummiresina	Pastinaca Opoponax	*Gum-resin of Opoponax*	Emmenagogue, stimulant	gr. x. to dr. ss.
Origanum	Origanum vulgare	*Common Marjoram*	Aromatic, stimulant	gr. v. to scr. i.
Ovum	Phasianus Gallus	*An Egg*	Nutritive	.....

PAPAVERIS Capsulæ	Papaver Somniferum	*Capsules of the White Poppy*	.....	.....
Petroleum	.....	*Petroleum*	Antispasmodic, sudorific	min. v. to f dr. ss.
Pimentæ Baccæ	Myrtus Pimenta	*Berries of Pimenta*	Aromatic, stimulant	gr. v. to scr. i.
Piperis longi Fructus	Piper longum	*Fruit of Long Pepper*	Aromatic, stimulant	gr. v. to scr. i.
Piperis nigri Baccæ	Piper nigrum	*Berries of Black Pepper*	Aromatic, stimulant	gr. v. to scr. i.
Pix abietina	Pinus Abies	*Burgundy Pitch*	.....	.....
Pix liquida	Pinus Sylvestris	*Tar*	Stimulant, diuretic, sudorific	.....
Pix nigra	———			
Plumbi Subcarbonas	Subcarbonas plumbi	*Subcarbonate of Lead*	.....	.....
Plumbi Oxydum semivitreum	.....	*Semi-vitrified Oxide of Lead*	.....	.....
Porri Radix	Allium Porrum	*Root of the Leek (the juice)*	Expectorant, diuretic	f dr. i. to f oz. ss.
Potassæ Nitras	Nitras Potassæ purificata	*Nitrate of Potass*	Diaphoretic, diuretic, refrigerant	gr. v. to dr. ss.
Potassæ Sulphas	Sulphas Potassæ	*Sulphate of Potass*	Cathartic	oz. i. to oz. iss.
Potassæ Supertartras	Supertartras Potassæ purificata	*Supertartrate of Potass*	Cooling, cathartic	dr. i. to dr. iii.

Potassa impura	Subcarbonas Potassæ impura	*Impure Potass*	Antilithic	gr. v. to gr. x.
Pruna	Prunus domestica	*Prunes*	Laxative	.....
Pterocarpi Lignum	Pterocarpus santalinus	*Red Saunders Wood*	.....	.....
Pulegium	Mentha Pulegium	*Pennyroyal*	Aromatic, stimulant	gr. x. to dr. i.
Pyrethri Radix	Anthemis Pyrethrum	*Root of the Pellitory of Spain*	Sialagogue, stimulant	gr. v. to gr. xv.
QUASSIÆ Lignum	Quassia excelsa	*Quassia Wood*	Tonic, stomachic	gr. v. to dr. ss.
Quercûs Cortex	Querc. pedunculata	*Bark of the Oak*	Astringent, tonic	gr. x. to dr. ss.
Quininæ Sulphas	.....	*Sulphate of Quinine*	Tonic	gr. ii. to gr. v.
Quininæ Extractum	.....	*Extract of Quinine*	Tonic	gr. iii. to gr. v.
RESINA flava	Pinus Sylvestris	*Yellow Resin*	.....	.....
Rhamni Baccæ	Rhamnus Catharticus	*Buckthorn Berries*	Cathartic	dr. i. to dr. ii.
Rhei Radix	Rheum Palmatum	*Root of Rhubarb*	Cathartic, stomachic, astringent	gr. x. to dr. ss.
Rhœados Petala	Papaver Rhœas	*Petals of the Red Poppy*	.....	.....
Ricini Oleum et Semina	Ricinus communis	*Castor Oil and Seeds*	Cathartic	f dr. ii. to f oz. i.

Rosæ Caninæ pulpa	Rosa camina	*Pulp of the Dog-rose (the Hip)*	Cooling	dr. i. to oz. i.
Rosæa centifoliæ Petala	Rosa centifolia	*Petals of the Damask Rose*	Laxative	scr. i. to dr. i.
Rosæ Gallicæ Petala	Rosa Gallica	*Petals of the Red Rose*	Astringent, tonic	scr. i. to dr. i.
Rosmarina cacumina	Rosmarinus Officinalis	*Tops of Rosemary*	Emmenagogue, tonic, stimulant	gr. x. to dr. ss.
Rubiæ Radix	Rubia Tinctorum	*Madder Root*	Astringent, emmenagogue	gr. xv. to scr. i.
Rutæ Folia	Ruta graveolens	*Leaves of Rue*	Emmenagogue, antispasmodic, stimulant	gr. xv. to scr. ii.
SABINÆ Folia	Juniperus Sabina	*Leaves of Savine*	Emmenagogue, stimulant, anthelmintic	gr. v. to gr. x.
Saccharum Saccharum purificatum	SaccharumOfficinale	*Sugar* *Refined Sugar*	....	....
Sagapenum	*The Gum-resin of a plant not yet described*	*Sagapenum*	Emmenagogue, antispasmodic	gr. x. to dr. ss.
Salicis Cortex	Salix Caprea	*Bark of the Willow*	Tonic, astringent	gr. xv. to dr. i.
Sambuci Flores	Sambucus Nigra	*Flowers of Elder*	.....	.....

Sapo durus	*Soap made from Oil of Olives and Soda*	*Hard Soap*	Cathartic, diuretic	gr. x. to dr. ss.
Sapo mollis	.....	*Soft Soap*	.....	.....
Sarsaparillæ Radix	Smilax Sarsaparilla	*Root of Sarsaparilla*	Diaphoretic, alterative	scr. i. to dr. i.
Sassafras Lignum et Radix	Laurus Sassafras	*Wood and Root of Sassafras*	Diaphoretic, stimulant, diuretic	scr. i. to dr. i.
Scammoneæ Gummi-resina	Convalvolus Scammonea	*Gum-resin of Scammony*	Cathartic	gr. iv. to scr. i.
Scillæ Radix	Scilla Maritima	*Root of the Squill*	Expectorant, diuretic, emetic in large doses	(*fresh*) gr. v. to x. (*dried*) gr. i. to gr. iii.
Senegæ Radix	Polygala Senega	*Root of Senega*	Diaphoretic, expectorant, stimulant	scr. i. to scr. ii.
Sennæ Folia	Cassia Senna	*Leaves of Senna*	Cathartic	scr. i. to dr. i.
Serpentariæ Radix	Aristilochia Serpentaria	*Serpentary or Snake-root*	Diaphoretic, stimulant, tonic	gr. x. to dr. ss.
Sevum	Ovis Aries	(*Mutton*) *Suet*	.....	.....
Simaroubæ Cortex	Quassia Simarouba	*Simarouba Bark*	Tonic, astringent	gr. x. to dr. i.
Sinapis Semina	Sinapis Nigra	*Mustard Seeds*	Stimulant, diuretic	dr. ss. to dr. i.
Sodæ Murias	Murias Sodæ	*Muriate of Soda*	Used in lotions	
Sodæ Sub-boras	Sub-boras Sodæ	*Sub-borate of Soda*	Diuretic, emmenagogue	gr. x. to dr. ss.

Sodæ Sulphas	Sulphas Sodæ	*Sulphate of Soda*	Cathartic	oz. i. to oz. ii.
Soda impura	Subcarbonas Sodæ impura	*Impure Soda*	.....	.....
Spartii Cacumina	Spartium Scoparium	*Broom Tops*	Cathartic, diuretic	scr. i. to dr. i.
Spigeliæ Radix	Spigelia Marilandica	*Root of the Indian Pink*	Anthelmintic, cathartic	gr. x. to scr. i.
Spiritus rectificatus	.....	*Rectified Spirit*	*Its specific gravity is to that of Distilled Water as* .835 *to* 1.000.	.....
Spiritus tenuior	.....	*Proof Spirit*	*Its specific gravity is to that of Distilled Water as* .930 *to* 1.000.	Stimulant
Spongia	Spongia Officinalis	*Sponge*	Deobstruent, tonic	dr. i. to oz. ss.
Stannum	Stanni Limatura	*Tin*	Anthelmintic	dr. i. to dr. iii.
Staphisagriæ Semina	Delphinium Staphisagria	*Seeds of Stavesacre*	Violent emetic, cathartic	gr. ii. to gr. x.
Stramonii Semina et Folia	Datura Stramonium	*Thorn Apple Seeds and Leaves*	Narcotic	.....
Styracis Balsamum	Styrax Officinale	*Balsam of Storax*	Expectorant, stimulant	gr. v. to dr. ss.
Succinum	.....	*Amber*	Antispasmodic	scr. i. to dr. i.

Sulphur	.....	*Sulphur*	Laxative	.....
Sulphur Sublimatum	.....	*Sublimed Sulphur*	Laxative	dr. ss. to dr. i.
TABACI Folia	Nicotiana Tabacum	*Leaves of Tobacco*	Expectorant, narcotic	gr. x. to gr. v.
Tamarindi Pulpa	Tamarindus Indica	*The Pulp of the Tamarind*	Laxative, refrigerant	dr. ss. to dr. iv.
Taraxaci Radix	Leontodon Taraxacum	*Root of the Dandelion*	Diuretic, aperient	dr. ss. to dr. i.
Tartarum	Potassæ Supertartras impura	*Tartar*	.....	.....
Terebinthina Canadensis	Pinus Balsamea	*Canadian Turpentine*	Stimulant, diuretic	scr. i. to dr. i.
Terebinthina Chia	Pistacia Terebinthus	*Cyprus Turpentine*	Stimulant, diuretic	scr. i. to dr. i.
Terebinthina vulgaris	Pinus Sylvestris	*Common Turpentine*	(*In glisters*) Diuretic, stimulant	dr. ii. to oz. i.
Terebinthinæ Oleum	Pinus Sylvestris	*Oil of Turpentine*	Cathartic anthelmintic	min. v. to f dr. i.
Testæ	Ostrea edulis	(*Oyster Shells*)	Absorbent, antacid	dr. ss. to dr. ii.
Tiglii Oleum	Croton Tiglium		Cathartic	min. ss. to min. x.
Tormentillæ Radix	Tormentilla Officinalis *Smith, Flor. Brit.*	*Root of Tormentil*	Astringent	gr. x, to dr. ss.

Toxicodendri Folia	Rhus Toxicodendron	*Leaves of Sumach*	Stimulant, narcotic	gr. ii. to gr. v.
Tragacantha	Astragalus verus *Oliver, Voy. dans l'Empire Ottom.*	*Tragacanth*	Demulcent	gr. x. to dr. i.
Tussilago	Tussilago Farfara	*Coltsfoot*	Expectorant	dr. ss. to dr. i.
VALERIANÆ Radix	Valeriana Officinalis, (Sylvestris)	*Root of Valerian*	Antispasmodic, stimulant	scr. i. to dr. i.
Veratri Radix	Veratrum Album	*Root of White Hellebore*	Violent cathartic, emetic	gr. ii. to gr. v.
Ulmi Cortex	Ulmus Campestris	*Bark of the Elm*	Diuretic, astringent, tonic	scr. i. to dr. i.
Uvæ Passæ	Vitis Vinifera	*Raisins*	.....	.....
Uvæ Ursi Folia	Arbutus Uva Ursi	*Leaves of the Wortleberry*	Tonic, diuretic, astringent	gr. x. to dr. i.
ZINCUM	.....	*Zinc*	.....	.....
Zingiberis Radix	Zingiber Officinale *Roscoe, in Act. Soc. Lin.*	*Ginger Root*	Stomachic, carminative	gr. v. to dr. ss.

CHEMICAL DECOMPOSITIONS,

WHICH TAKE PLACE IN THE FORMATION OF VARIOUS PHARMACEUTICAL PREPARATIONS.

ACIDA.

ACIDUM ACETICUM.

VINEGAR.

The vinegar being deprived, by distillation, of its colouring matter, or *extractive property*, and a small quantity of *tartar*, &c. is rendered more fit for use.

ACIDUM BENZÖICUM.

Antispasmodic, expectorant, five gr. to fifteen.

BENZÖIN,—FRESH LIME,—WATER,—MURIATIC ACID.

Decomposition.—The *benzöic acid* is separated from the benzöin by the *lime*; the *muriatic acid* being added to this *benzoate of lime*, a soluble *muriate of lime* is formed, and the BENZÖIC ACID is precipitated.

ACIDUM CITRICUM.

Refrigerant, five gr. to half a dr.

JUICE OF LEMONS,—PREPARED CHALK,—DILUTED SULPHURIC ACID.

Decomposition.—The *carbonic acid** of the *chalk* passes off in the form of gas, and its other constituent, *lime*, forms with the *lemon juice* an *insoluble citrate of lime*. The *sulphuric acid* being added, unites with the *lime*, forming an *insoluble sulphate of lime*, which remains on the filtering paper, and the CITRIC ACID passes through dissolved.

ACIDUM MURIATICUM.†

Tonic, five drops to twenty.

DRIED MURIATE OF SODA (*common salt*),—SULPHURIC ACID, —DISTILLED WATER.

Decomposition.—The *sulphuric acid* forms with the *soda* a *sulphate of soda*, and the *muriatic acid* thus at liberty is distilled over in the form of gas, and absorbed by the water placed in the receiver for that purpose.

ACIDUM NITRICUM.‡

Tonic, antisyphilitic, five drops to thirty.

NITRATE OF POTASS (*saltpetre*),—SULPHURIC ACID.

Decomposition.—The *sulphuric acid* forms with the *potass* a *super-sulphate of potass*, and the *nitric acid* is distilled over.

ACIDUM SULPHURICUM DILUTUM.

Tonic, astringent, five drops to thirty.

Sulphuric acid is composed of *Sulphur* and *oxygen.*

Sulphur*ic* acid is a stronger acid than the sulphur*ous* acid, owing to its containing more *oxygen*, which is its acidifying principle.

* CARBONIC ACID is a compound of *oxygen* and *carbon.*

† MURIATIC ACID is a compound of *hydrogen* and *chlorine.*

‡ NITRIC ACID is composed of *nitrogen* and *oxygen.*—One ounce of this acid ought to dissolve an ounce of limestone.

ALKALIA, ET EORUM SALES.

PREPARATIONS OF AMMONIA.

Ammoniæ Subcarbonas.—Liquor Ammoniæ.—Liquor Ammoniæ Acetatis.—Liquor Ammoniæ Subcarbonatis.

AMMONIÆ* SUBCARBONAS.

Stimulant, antacid, antispasmodic, five gr. to fifteen.

MURIATE OF AMMONIA,—PREPARED CHALK.

Decomposition.—An exchange of acids takes place, the *ammonia* giving its *muriatic acid* to the *lime* of the chalk, forming a *muriate of lime,* and the *chalk* parting with its *carbonic acid* to the *ammonia,* with which it is sublimed—forming a *subcarbonate of ammonia.*†

LIQUOR AMMONIÆ.‡

Antacid, five drops to twenty.

MURIATE OF AMMONIA,—FRESH LIME,—WATER.

Decomposition.—The *muriatic acid* unites with the *lime,* forming a *muriate of lime,* and the *ammonia* being dissolved by the water, is ordered to be distilled over.

* AMMONIA is sometimes called the volatile alkali.

† This is called a *sub*-carbonate, because there is an insufficiency of carbonic acid to saturate the ammonia.

‡ Ammonia is composed of hydrogen and nitrogen.

LIQUOR AMMONIÆ ACETATIS.

Diaphoretic, one fluid dr. to one fluid oz.

SUBCARBONATE OF AMMONIA,—ACETIC ACID.

Decomposition.—The *carbonic acid* of the subcarbonate is disengaged, and flies off, and the *ammonia* forms with the *acetic acid*, an ACETATE of AMMONIA.

LIQUOR AMMONIÆ SUBCARBONATIS.

Stimulant, diuretic, half a fluid dr. to one fluid dr.

This is merely a solution of the *sub-carbonate of ammonia in water.*

PREPARATIONS OF POTASS.

Liquor Potassæ.—Liq. Pot. Subcarb.—Pot. cum Calce.—Pot. Fusa.—Pot. Acetas.—Pot. Carbonas.—Pot. Subcarbonas.—Pot. Sulphas.—Pot. Supersulphas.—Pot. Tartras.

LIQUOR POTASSÆ.

Antacid, lithontriptic, five drops to half a fluid dr.

SUBCARBONATE OF POTASS,—FRESH LIME,—DISTILLED WATER.

Decomposition.—The *carbonic acid* unites with the *lime*, forming a *carbonate of lime*, which remains on the filter, while the *potass* passes through dissolved in the water.

POTASSA CUM CALCE.

This is merely a mechanical *mixture of lime and potass.*

POTASSA FUSA.

LIQUOR OF POTASS.

The heat evaporates the water, leaving *the potass in a solid state.*

POTASSÆ ACETAS.

Diuretic, ten gr. to one dr.

SUBCARBONATE OF POTASS,—ACETIC ACID.

Decomposition.—The *carbonic acid* being expelled, the *potass* unites with the acetic acid, forming *an acetate of potass in solution*, to be obtained by crystallization.

POTASSÆ CARBONAS.

Diuretic, antacid, ten gr. to half a dr.

SUBCARBONATE OF POTASS,—SUBCARBONATE OF AMMONIA, —WATER.

Decomposition.—The *ammonia* being driven off by the heat employed, its *carbonic acid* forms with the *subcarbonate* a *perfect carbonate of potass.*

POTASSÆ SULPHAS.

Cathartic, half a dr. to three dr.

SUPERSULPHATE OF POTASS,—SUBCARBONATE OF POTASS.

Decomposition.—The superabundant sulphuric acid is neutralized by the *potass* of the *subcarbonate*, and the carbonic acid is expelled, leaving a *sulphate of potass.*

POTASSÆ SUPERSULPHAS.

Cathartic, half a dr. to two dr.

The salt which remains after the distillation of nitric acid, is the supersulphate of potass.

POTASSÆ TARTRAS.

Cathartic, one dr. to four.

SUBCARBONATE OF POTASS,—SUPERTARTRATE OF POTASS,—WATER.

Decomposition.—The *carbonic acid* of the subcarbonate being expelled, the potass unites with the superabundant tartaric acid of the supertartrate. A *perfect tartrate* is the result.

PREPARATIONS OF SODA.

Soda Tartarizata.—Sodæ Carbonas.—Sodæ Subcarb. exsiccata.—Sodæ Sulphas.

SODA TARTARIZATA.*

Cathartic, two dr. to six.

SUBCARBONATE OF SODA,—SUPERTARTRATE OF POTASS,—WATER.

Decomposition.—The *carbonic acid* is expelled, and the *soda* is taken up by the excess of *tartaric acid;* a triple salt is thus formed, consisting of *tartaric acid, soda, and potass.*

SODÆ CARBONAS.

Antacid, ten gr. to one dr.

SUBCARBONATE OF SODA,—WATER,—SUBCARBONATE OF AMMONIA.

Decomposition.—The ammonia being driven off by the heat, its carbonic acid is taken up by the soda, forming the *carbonate of soda.*

* A tartrite of potass and soda.

SODÆ SUBCARBONAS* EXSICCATA.

Antacid, diuretic, lithontriptic, five gr. to half a dr.

The water of crystallization of the subcarbonate of soda is driven off by heat.

SODÆ SULPHAS.

GLAUBER SALTS.

Cathartic, two dr. to two oz.

SUPERSULPHATE OF SODA, (*which remains after the distillation of Muriatic Acid,*)—SUBCARBONATE OF SODA.

Decomposition.—The *super*abundant acid is saturated with the *soda* of the subcarbonate, forming a sulphate of soda, while the *carbonic acid* escapes.†

TERRÆ ET EARUM SALES.

ALUMEN EXSICCATUM.

Astringent, ten gr. to half a dr.

The water of crystallization of the alum is driven off by heat.

* Salts owe their transparency and form to the water of crystallization they contain.

† Soda and potass are fixed alkalies; the former is called the mineral, and the latter the vegetable alkali.

ALUM,

Consists of sulphuric acid, alumina, and potass.

CALCIS MURIAS.

The salt which remains after the distillation of the subcarbonate of ammonia, is the *muriate of lime*.

CALX,*

Limestone (Chalk),

Is subjected to a strong heat, in order to expel its carbonic acid; *pure lime* is the result.

MAGNESIA.*

Antacid, cathartic, one scr. to two dr.

CARBONATE OF MAGNESIA.

The heat drives off the carbonic acid; pure magnesia is the result.

MAGNESIÆ CARBONAS.

SULPHATE OF MAGNESIA,—SUBCARBONATE OF POTASS,—WATER.

Decomposition.—An exchange of acids takes place. The *sulphuric acid* forms with the *potass* a soluble *sulphate of potass*, and the *carbonic acid* forms with the *magnesia* an insoluble *carbonate of magnesia*.

* This preparation should be kept in glass stopper bottles.

METALLA, ET EORUM SALES.

PREPARATIONS OF ANTIMONY.

Antimonii Oxydum.—Antimonium Tartarizatum.—Liquor Antimonii Tartarizati.—Pulvis Antimonialis.

ANTIMONII OXYDUM.

Alterative, diaphoretic, two gr. to fifteen.

TARTARIZED ANTIMONY,—SUBCARBONATE OF AMMONIA,—WATER.

Decomposition.—The *ammonia* parts with its *carbonic acid,* and forms, with the *tartaric acid* and *potass* of the *tartarized antimony,* a triple salt in solution, and the OXIDE OF ANTIMONY is precipitated.

ANTIMONIUM TARTARIZATUM.

EMETIC TARTAR.

Emetic, one gr. to three; *diaphoretic, expectorant,* one eighth gr. to half gr.

SULPHURET OF ANTIMONY,—NITRATE OF POTASS,—SUPER-TARTRATE OF POTASS,—SULPHURIC ACID,—WATER.

The antimony decomposes the nitrate of potass, and becomes oxidized at the expense of the nitric acid, forming a protoxide of antimony; part of the sulphuric acid is supposed to act upon this protoxide; if so, a subsulphate of antimony and potass is the result.*

* This is by no means a satisfactory explanation.

The supertartrate of potass being added, and the whole thrown into water, a triple salt is obtained in solution, consisting of *tartaric acid, antimony, and potass.*

The *sulphur* of the *sulphuret* is left on the filter in the early stage of the process.

PULVIS ANTIMONIALIS.*

SULPHURET OF ANTIMONY,—HARTSHORN SHAVINGS.

Decomposition.—The sulphur of the sulphuret, and the gelatin of the hartshorn shavings, are destroyed by the heat employed. The antimony attracts oxygen from the air, and unites with the phosphate of lime.

PREPARATION OF SILVER.

ARGENTI NITRAS.

LUNAR CAUSTIC.

(*Used in Epilepsy*), one-eighth gr. to one gr.

SILVER,—NITRIC ACID,—WATER.

Decomposition.—The *silver* decomposes *part* of the *nitric acid*, and becomes oxidized; nitrous gas escapes, and the *oxide of silver*, as it forms, is dissolved by the remaining acid, forming the *nitrate of silver.*

* This preparation is a mechanical mixture of *phosphate of lime and antimony.*

PREPARATIONS OF ARSENIC.

Arsenici Oxydum Sublimatum.—Liquor Arsenicalis.

LIQUOR ARSENICALIS.

FOWLER'S SOLUTION.

(*Used in Agues*), two drops to twenty.

SUBLIMED OXIDE OF ARSENIC,—SUBCARBONATE OF POTASS, WATER,—COMPOUND SPIRIT OF LAVENDER.

Decomposition.—The *arsenious acid* forms with the *potass* a solution of *arsenite of potass.*

PREPARATIONS OF COPPER.

Cuprum Ammoniatum.—Liquor Cupri Ammoniati.—Cupri Sulphas.

CUPRUM AMMONIATUM.

Antispasmodic, a quarter gr. to five gr.

SULPHATE OF COPPER,—SUBCARBONATE OF AMMONIA.

Decomposition.—The *ammonia* forms with the *sulphate of copper* a triple salt, consisting of *sulphuric acid, ammonia, and copper;* the *carbonic acid* escapes.

PREPARATIONS OF IRON.

Ferrum Ammoniatum.—Ferri Subcarbonas.—Ferri Sulphas.—Ferrum Tartarizatum.—Liquor Ferri Alkalini. Tinctura Ferri Muriatis.—Vinum Ferri.—Pilulæ Ferri cum Myrrhâ.—Mistura Ferri Composita.

MISTURA FERRI COMPOSITA.

Tonic, emmenagogue, one fluid oz. to two.

SULPHATE OF IRON,—SUBCARBONATE OF POTASS,—WATER.

The sulphuric acid combines with the potass, and the carbonic acid with the oxide of iron.

FERRUM AMMONIATUM.

Tonic, emmenagogue, five gr. to fifteen.

SUBCARBONATE OF IRON,—MURIATE OF AMMONIA.

Decomposition.—The iron parts with its carbonic acid, and combines with the muriate of ammonia, forming a *submuriate of ammonia and iron.*

FERRI SUBCARBONAS.

Tonic, emmenagogue, three gr. to ten.

SULPHATE OF IRON,—SUBCARBONATE OF SODA,—WATER.

Decomposition.—An exchange of acids is effected; the *soda* taking the *sulphuric acid* of the *iron,* forming in solution a *sulphate of soda,* while the *iron* takes the *carbonic acid* of the *soda,* forming *an insoluble subcarbonate of iron.*

FERRI SULPHAS.

Tonic, gr. two to six.

IRON,—SULPHURIC ACID,—WATER.

Decomposition.—Part of the water being decomposed, the iron is oxidized at its expense; it then unites with the sulphuric acid, forming a *sulphate of iron*, which is dissolved by the remaining water.

FERRUM TARTARIZATUM.*

Tonic, astringent, five gr. to fifteen.

IRON,—SUPERTARTRATE OF POTASS,—WATER.

Decomposition.—The iron is oxidated by attracting oxygen from the water and atmospheric air; the superabundant tartaric acid combines with this oxide, and a triple salt is obtained, composed of *tartaric acid, potass, and iron.*

LIQUOR FERRI ALKALINI.

Tonic,—emmenagogue, half a fluid dr. to five.

IRON,—NITRIC ACID,—WATER,—LIQUOR OF SUBCARBONATE OF POTASS.

Decomposition.—The *iron* is oxidized at the expense of *part* of the *nitric acid*, and is dissolved by the remaining acid as it forms; the *subcarbonate of potass* being added, gives off its *carbonic acid*, and the *potass* forms, with the *nitrate of iron*, a *solution of alkaline iron.*

TINCTURA FERRI MURIATIS.

Tonic, ten drops to half a fluid dr.

* A tartrate of potass and iron.

SUBCARBONATE OF IRON,—MURIATIC ACID,—RECTIFIED SPIRIT.

Decomposition.—The *carbonic acid* escapes, and the iron is taken up by muriatic acid; this *muriate of iron* is *dissolved by the spirit.*

VINUM FERRI.*

Tonic, astringent, ten drops to half a fluid oz.

IRON FILINGS,—WINE.

Decomposition.—The *tartaric acid* of the *wine* oxidizes the iron, and dissolves it as it forms.

PREPARATIONS OF MERCURY.

Hydrargyri Nitrico-Oxydum.—Hydr. Oxydum Cinereum.—Hydr. Oxyd. Rubrum.—Hydr. Oxymurias.—Hydr. Submur.—Hydr. Sulphuretum Nigrum.—Hydr. Sulphuretum Rubrum.—Hydrargyrum cum Creta.—Hydrargyrum Præcipitatum Album.—Hydr. Purificatum. Liquor Hydrargyri Oxymuriatis.—Pilulæ Hydrargyri. Pilulæ Hydrargri Submuriatis Compositæ.—Linimentum Hydrargyri.—Unguentum Hydrargyri Fortius.—Ung. Hydr. Mitius.—Ung. Hydr. Nitratis.—Ung. Hydr. Nitrico-oxydi.—Ung. Hydr. Præcipitati Albi.

HYDRARGYRI NITRICO-OXYDUM.

(*Used externally as a detergent escharotic.*)

MERCURY,—NITRIC ACID,—WATER.

Decomposition.—The *mercury* is oxidized, and dissolved by the *nitric acid,* forming *a nitrate of mercury.* The

* A solution of tartrate of iron.

heat being increased, *nitrous gas* is evolved, and the preparation is reduced to *a sub-nitrate of mercury*.

HYDRARGYRI OXYDUM CINEREUM.

Antisyphilitic, one gr. to three.

SUBMURIATE OF MERCURY,—LIQUOR OF LIME.

Decomposition.—The muriatic acid of the mercury unites with the lime in solution, and the *grey oxide* is precipitated.

HYDRARGYRI OXYDUM RUBRUM.

Antisyphilitic, one-fourth of a gr. to two gr.

PURIFIED MERCURY.

Decomposition.—The mercury, being volatilized by the heat employed, is enabled to attract oxygen from the air; *a red oxide* is the result.

HYDRARGYRI OXYMURIAS.

Corrosive Sublimate.

Antisyphilitic, one-eighth of a gr. to half a gr.

PURIFIED MERCURY,—SULPHURIC ACID,—MURIATE OF SODA.

Decomposition.—The mercury is oxidized, and dissolved by the sulphuric acid. This being evaporated to dryness, a salt is obtained, which is an oxysulphate of mercury; muriate of soda being added, its muriatic acid unites with the oxide of mercury, forming an *oxymuriate of mercury*, which is sublimed, leaving the sulphuric acid in combination with the soda.

HYDRARGYRI SUBMURIAS.

Calomel.

Alterative, antisyphilitic, one gr. to two; and *Cathartic,* three grains to ten.

OXYMURIATE OF MERCURY,—PURIFIED MERCURY.

Decomposition.—The purified mercury is oxidized at the expence of part of the oxygen of the oxymuriate. Sublimation assists the combination of the two oxides, and the result is a *muriate of mercury.**

HYDRARGYRI SULPHURETUM NIGRUM.

Alterative, five grains to one scr.

PURIFIED MERCURY,—SUBLIMED SULPHUR.

Decomposition.—The mercury is slightly oxidized, and combines with the sulphur, forming a *black sulphuret.*

HYDRARGYRI SULPHURETUM RUBRUM.

Alterative, five grains to one scr.

PURIFIED MERCURY,—SUBLIMED SULPHUR.

Decomposition.—The mercury being oxidized, unites intimately with the sulphur, *by the assistance of heat,* forming a *red sulphuret.*

HYDRARGYRUM CUM CRETA.

Alterative, ten gr. to one dr.

PURIFIED MERCURY,—PREPARED CHALK.

Decomposition.—The mercury is mechanically mixed with the carbonate of lime (or chalk.)

* The London College call it a *sub*-muriate, to prevent mistakes.

HYDRARGYRUM PRÆCIPITATUM ALBUM.

(*Externally used as a detergent.*)

OXYMURIATE OF MERCURY,—MURIATE OF AMMONIA,—LIQUOR OF SUBCARBONATE OF POTASS,—WATER.

Decomposition.—The muriate of ammonia combines with the oxymuriate of mercury, and renders it more soluble in water; thus we obtain a supermuriate of mercury and ammonia; the subcarbonate of potass being added, the potass takes a portion of the muriatic acid, and remains in solution; *a muriate of ammonia and mercury* being precipitated, the *carbonic acid* escapes.

HYDRARGYRUM PURIFICATUM.

MERCURY,—IRON FILINGS.

Decomposition.—The iron filings are used because they have a greater affinity for any matter the mercury may be mixed with.

PREPARATIONS OF LEAD.

Liquor Plumbi Subacetatis.—Liquor Plumbi Subacetatis dilutus.—Plumbi Superacetas.—Emplastrum Plumbi.

LIQUOR PLUMBI SUBACETATIS*.

SEMI-VITREOUS OXIDE OF LEAD,—ACETIC ACID.

Decomposition.—The acetic acid unites with the lead, forming a *subacetate,* which remains in solution.

PLUMBI SUPERACETAS†.

* Rather, an acetate of lead in solution.

† This is called a superacetate, because there is more acid than the lead requires to saturate it.

SUGAR OF LEAD.

Astringent, half a gr. to two gr.

CARBONATE OF LEAD,—ACETIC ACID.

Decomposition.—The *carbonic acid* escapes, and the lead combines with the acetic acid, forming a *superacetate.*

PREPARATIONS OF ZINC.

Calamina Præparata.—Zinci Oxydum.—Zinci Sulphas. Unguentum Zinci.

ZINCI OXYDUM.

Tonic, antispasmodic, one gr. to three.

ZINC.

The zinc being assisted by heat, is oxidized by the air; a *white oxide of zinc* is the result.

ZINCI SULPHAS.

White Vitriol.

Emetic, ten gr. to one scr.; *tonic, astringent*, half a gr. to three.

ZINC,—SULPHURIC ACID,—WATER.

Decomposition.—The zinc effects a decomposition of the water, and becomes oxidized. The sulphuric acid dissolves the oxide, and the *sulphate of zinc* is then evaporated to dryness.

PREPARATIONS OF SULPHUR.

Oleum Sulphuratum.—Potassæ Sulphuretum.—Sulphur Lotum.—Sulphur Præcipitatum.—Unguentum Sulphuris.—Unguent. Sulphuris compositum.

POTASSÆ SULPHURETUM.

Diaphoretic, three gr. to one scr.

WASHED SULPHUR,—SUBCARBONATE OF POTASS.

Decomposition.—The *carbonic acid* being disengaged, the sulphur unites with the potass, forming a *sulphuret of potass.*

SULPHUR PRÆCIPITATUM.

Cathartic, diaphoretic, one scr. to two dr.

LIME,—SULPHUR,—WATER,—MURIATIC ACID.

Decomposition.—First, the sulphur attracts a portion of hydrogen from the water, and unites with the lime, forming an hydroguretted sulphuret of lime in solution; the muriatic acid then enters into combination with the lime, the hydrogen escapes, and the *sulphur is precipitated.*

ANTIDOTES

IN

CASES OF POISON.

Acidum muriaticum, }
——— *nitricum*, } Soap and water, magnesia, preparations of soda and potass, carbonate of lime.
——— *sulphuricum*, }

Aconitum napellus, } Sugar and water, acidulated drinks, cordials.

Ærugo, } Sugar and water in considerable quantities.

Alkalies, } Lemon juice, vinegar, and other vegetable acids.

Antimonium tart. } Decoctions of galls, cinchona bark, oak bark, or any astringent vegetable, oily and mucilaginous fluids.

Argenti nitras, } Salt and water, mucilaginous fluids, broths.

Arsenicum, } Emetics of sulphate of zinc, or ipecacuanha, washing out the stomach, lime water, soap and water, chalk and water, sugar and water, milk, mucilaginous drinks, solutions of potass, bleeding, &c.

Atropa belladonna, } Sulphate of zinc as an emetic, castor oil, vinegar, and other acids.

Barytes, } Emetics, sulphate of soda, or of magnesia in solution.

Bismuthum, } Emetics, lime water, soap and water, sugar and water, milk, mucilaginous drinks, &c.

Camphora, } Wine, repeated small doses of opium.

Cantharides, } Sugar and water, oil, milk, mucilages.

Colchicum,	Emetics, warm sugar and water, opium, cordials.
Colocynth.	Emetics, opium, mucilaginous drinks, emollient anodyne clysters, &c.
Cuprum ammoniatum,	Sugar and water, sugar and coffee.
Cupri sulphas, —— *acetas,* —— *carbonas,*	Mucilaginous drinks, whites of eggs, castor oil, &c. sugar and water.
Conium maculatum,	Sulphate of zinc as an emetic, castor oil, acids.
Digitalis,	Emetics of sulphate of zinc, aromatics, cordials, opium.
Elaterium,	Cordials, opium, emollient anodyne clysters, demulcents.
Euphorbium,	Emetics, opium, mucilaginous drinks, emollient anodyne clysters.
Ferri sulphas,	Magnesia, warm water, any alkali.
Gambogia,	Emetics, opium, mucilages, anodyne oleaginous clysters.
Hellebore,	Oleaginous and mucilaginous drinks, anodyne emollient clysters.
Hydrargyri-oxymurias,	White of eggs beaten up with water, soap and water, wheat flour and water, which are also the antidotes to all the mercurial preparations.
Hyosciamus,	Sulphate of zinc as an emetic, castor oil, and acidulated liquids, bleeding, &c.
Mezerei cortex et baccæ,	Oleaginous and demulcent fluids.
Opium and its preparations,	Emetics of sulphate of zinc, or blue vitriol, in a little water, tickling the throat with a feather, or the finger, to excite vomiting; washing out the stomach, vinegar and acidulated drinks, constant agitation of the body, cold affusion, bleeding, purgative clysters, &c.

Plumbi subcarbonas,	Excite vomiting, sulphate of soda, or of magnesia, in solution, castor oil, mucilaginous drinks, clysters, &c.
—— *acetas,*	
Potassæ nitras,	Emetics, milk, mucilaginous fluids, opium in emollient clysters, &c.
Savine,	See *Colocynth.*
Scammony,	
Staphisagriæ semina,	
Stanni murias,	Milk in large quantities; if inflammation, bleeding, &c.
Tabaci folia,	Emetics, castor oil, acids, cordials. See *Belladonna.*
Veratri radix,	See *Hellebore.*
Zinci sulphas,	Excite vomiting by warm water and emollient drinks, milk is particularly proper, opiates; guard against inflammation by bleeding, &c.

TABLE OF SALTS,

WHICH, ON BEING ADDED TOGETHER, IN SOLUTION, MUTUALLY DECOMPOSE EACH OTHER.

Fixed alkaline sulphates,	Nitrates of lime and magnesia, muriates of lime and magnesia.
Sulphate of lime,	Alkalies, carbonate of magnesia, muriate of barytes.
Alum,	Alkalies, muriate of barytes, nitrate, muriate, carbonate of lime, carbonate of magnesia.
Sulphate of magnesia,	Alkalies, muriate of barytes, nitrate and muriate of lime.
Sulphate of iron,	Alkalies, muriate of barytes, earthy carbonates.
Muriate of barytes,	Sulphates, alkaline carbonates, earthy carbonates.
Muriate of lime,	Sulphates, excepting of lime, alkaline carbonates, carbonate of magnesia.
Muriate of magnesia,	Alkaline carbonates and sulphates.
Nitrate of lime,	Alkaline carbonates, carbonates of magnesia and alumine, sulphates, excepting of lime.

FINIS.

ERRATUM.

Page 26, before the words "*os magnum*," insert "*os trapezoides*."